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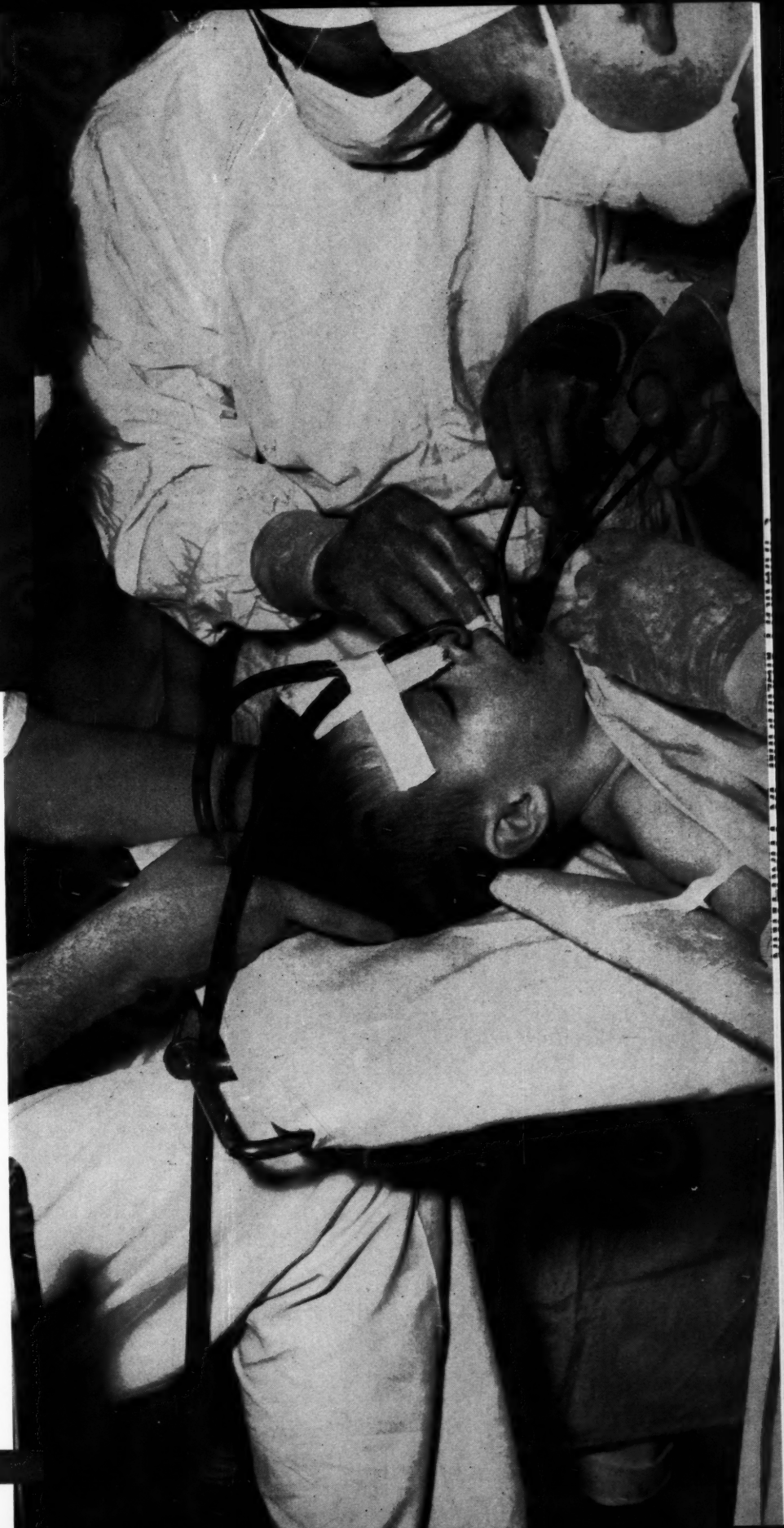
July 1952

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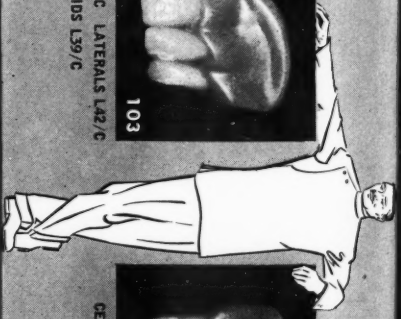
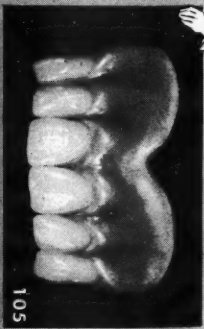
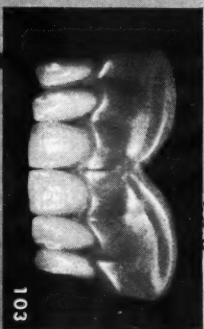
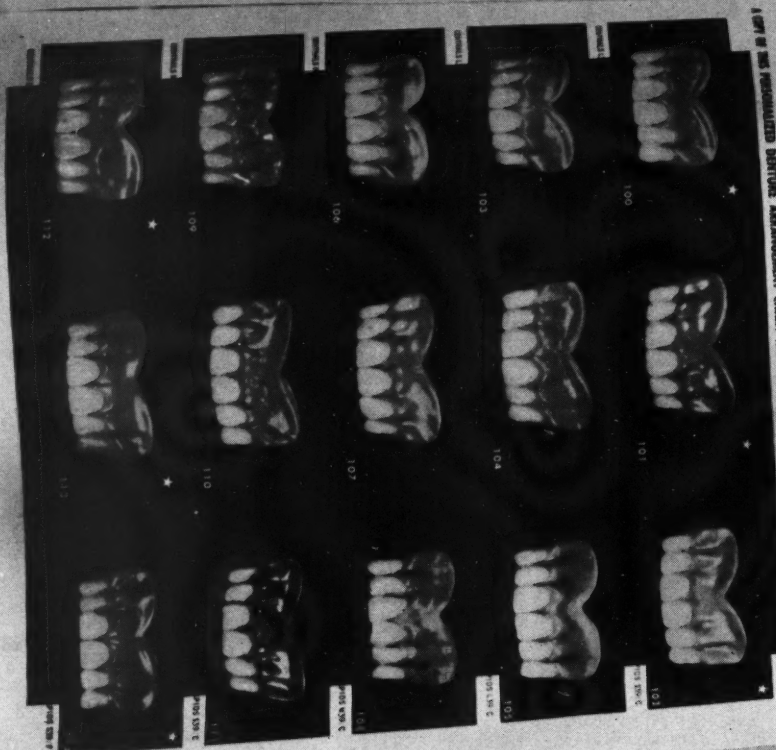
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FIVE-PHASE ANTERIOR PERSONALIZED DENTURE ARRANGEMENTS

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VICTOR H. SEARS, D.D.S. (University of Illinois, College of Dentistry, 1916) is the author of seven books on dentistry, many of them translated into foreign languages, and more than a hundred articles. Doctor Sears has invented numerous dental devices and is the originator of nonanatomic tooth forms which have widely influenced tooth design. In the current issue Doctor Sears presents CENTRIC JAW RELATION.

HARRY MAETH, D.D.S. (Columbia University, 1925) is well known to DIGEST readers for his many valuable contributions. This month Doctor Maeth reports the results from the use of the new antibiotic, terramycin, which he has employed successfully in a wide variety of ways in his own dental practice.

LOUIS B. KELSTEN, D.D.S. (University of Maryland Dental School, 1937) limits his practice to pedodontics and is the author of many articles on this subject. Doctor Kelsten is also chief of service, pedodontics section, Beth Israel Hospital, Newark. In his present article Doctor Kelsten describes in detail modern methods of treating injuries of children's anterior teeth.

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Dental Procedures and General Anesthesia

in CEREBRAL PALSY

MANUEL M. ALBUM, D.D.S., Philadelphia

DIGEST

This article brings up to date the knowledge concerning the techniques employed in dental procedures and the administration of general anesthesia for cerebral palsied children, who must frequently be totally anesthetized in order to be treated.

A step-by-step description of the technique to be used in administering the anesthetic and measures to be taken preoperatively and postoperatively are presented.

Anesthetics Frequently Required

In the treatment of certain types¹ of cerebral palsied children, it often becomes necessary for the dentist to resort to the use of either local or general anesthesia in order to complete treatment successfully.

Use of Local Anesthetics—Local anesthesia enables the dentist to perform extractions and operative treatment easily and satisfactorily on many children. However, it is not always possible to use local anesthesia in all phases of cerebral palsy. Some children can only be treated properly

if they are placed under some form of general anesthesia.

Several Agents and Methods Employed—A general anesthetic may consist of several different agents or methods, but the most important requisite for successful use of any anesthetic procedure is the behavior of the child.^{2,3} Dealing carefully with the cerebral palsied patient, and making certain that the child is comfortable and not frightened, will contribute to the efficiency of the anesthesia. When the child is cooperative, less anesthesia will be used and the administration of the anesthesia will follow a more uniform course.

General Considerations

An anesthetic agent is only safe to the degree of skill and knowledge possessed by the administrator.⁴ If the anesthetist does not have complete knowledge of the properties of the anesthetic agent being used, and a thorough understanding of the physical condition of the patient, permanent injury to the patient and embarrassment to the surgeon and the operator will result.

Physical Examination Important—Prior to anesthesia, the patient should always have a thorough physical examination. Occasionally, children have cardiac murmurs unknown to the parents.

Anesthetic Indicated—Although it might denote aortic regurgitation, mitral stenosis, or other valvular lesions, cardiac murmur is not a contraindication for the use of a general anesthetic. However, the knowledge of the murmur will be helpful to the anesthetist.

Physiologic Factors—Anemic patients are low in oxygen intake and consequently require a higher percentage of oxygen in anesthesia. Fat or full-blooded persons need more air in the induction stages of anesthesia than thin anemic patients.

Contraindications to Anesthesia—Pronounced asthma, colds, and influenza contraindicate the use of nitrous oxide. If the patient's temperature is elevated, it is advisable to delay the operation and refrain from using anesthesia until the temperature has subsided. It may not always be possible to postpone treatment because of an elevated temperature, but when possible, it would be wise to do so.

Action of Anesthetic Agents—General anesthetics are chemical substances which act directly on the brain, inhibiting its function, while leaving unaffected the autonomic centers of respiration and circulation. To be satisfactory, anesthesia must be painless, thorough, and devoid of danger. It is the operator's obligation to the cerebral palsied child to refrain from inflicting excessive or needless pain.

Nitrous Oxide Recommended—No perfect anesthetic method or agent exists although nitrous oxide is the mildest and least toxic of the common general anesthetics. It must be noted, however, that the anoxic state

¹Album, Manuel M.: Dentistry—An Asset to the Cerebral Palsied Child, *DENTAL DIGEST* 56:258-263 (June) 1950.

Author's Note: The pictures used to illustrate this article were taken at Children's Hospital, Philadelphia, and the surgery performed under the anesthetic procedure described was done at this hospital. The author also expresses appreciation to the Department of Anesthesiology of Children's Hospital for assistance in devising the method of utilizing a combination of agents for use in prolonged anesthesia.

²Album, Manuel M.: Dentistry Adapted to Cerebral Palsy, *Crippled Child Magazine* 27:No. 3, 11 (October) 1949.

³Album, Manuel M.: Parents of Cerebral Palsied Children: Guard Their Teeth, *Crippled Child Magazine* 26:No. 3, 24 (October) 1948.

⁴Album, Manuel M.: Dental Techniques and Treatment in Cerebral Palsy, *DENTAL DIGEST* 57:64-67 (February) 1951.

may be produced more readily with nitrous oxide anesthesia than with other agents because the oxygen intake is restricted to strengthen the normally weak anesthetic action of the nitrous oxide.

Margin of Anesthesia Slight: With the use of nitrous oxide the margin of anesthesia is slight and the passage from the light to the deep plane may be extremely rapid (during induction) or the deep plane may be slow and insidious (prolonged anesthesia).

Level of Safety Must be Maintained: Nitrous oxide ceases to be a mild innocuous agent but produces liver damage, acidosis, and neurologic complications if a safe oxygen level is not maintained.

Incidence of Brain Injury—With any general inhalation anesthetic in use today brain damage can occur. This occurrence is the result of too deep or too prolonged anesthesia and

can be further influenced by an obstructed or non-patent airway. Deprivation of oxygen will result in damage to the brain.

Problems with Young Children—Quite often extremely young children are difficult to control under nitrous oxide-oxygen anesthesia for the following reasons: (1) Their blood volume is relatively small; hence they go into deep anesthesia rapidly and respond rapidly to a slight excess of oxygen, (2) their nervous systems are unstable or immature, and (3) their basal metabolic rate is high; hence they burn up oxygen more rapidly than an adult.

Premedication

The amount of the anesthetic agent required will be reduced by premedication which will also make the anesthetic easier to administer. However, few young cerebral palsied children

can be given any medication by mouth. For this reason, capsules containing any of the barbiturates cannot be used effectively on the majority of cerebral palsied children. For satisfactory results on these patients premedication must be given parenterally or rectally.

Dosage—For all premedication dosage is determined by the body weight of the child and is given one hour prior to surgery (Table 1).

Composition of the Agent—Premedication consists of a combination of morphine sulfate and scopolamine, given parenterally. Nembutal® is administered orally when possible, otherwise by rectum. The premedication described is used for all types of anesthesia.

Anesthetic Procedure

The anesthetic routines described are intended to be completed only as

TABLE I
Preoperative Medication

Age	Weight	Morphine and Nembutal		Scopolamine or Atropine	
Up to 2 mos.	7 - 10 lbs.	Grain 1/480	—	Grain 1/600	Grain 1/400
2 - 3 mos.	10 - 12 lbs.	Grain 1/320	—	Grain 1/600	Grain 1/400
3 - 4 mos.	12 - 14 lbs.	Grain 1/240	—	Grain 1/600	Grain 1/400
4 - 7 mos.	14 - 16 lbs.	Grain 1/144	—	Grain 1/600	Grain 1/400
7 - 11 mos.	16 - 19 lbs.	Grain 1/112	—	Grain 1/600	Grain 1/400
11 - 18 mos.	19 - 24 lbs.	Grain 1/96	Grain 1/4	Grain 1/450	Grain 1/300
18 - 24 mos.	24 - 27 lbs.	Grain 1/72	Grain 1/4	Grain 1/450	Grain 1/300
2 - 3 yrs.	28 - 30 lbs.	Grain 1/64	Grain 1/4	Grain 1/400	Grain 1/300
3 - 5 yrs.	30 - 40 lbs.	Grain 1/48	Grain 1/2	Grain 1/300	Grain 1/200
5 - 8 yrs.	40 - 55 lbs.	Grain 1/32	Grain 1/2	Grain 1/300	Grain 1/200
8 - 10 yrs.	55 - 65 lbs.	Grain 1/24	Grain 1	Grain 1/200	Grain 1/100
10 - 12 yrs.	65 - 80 lbs.	Grain 1/16	Grain 1	Grain 1/200	Grain 1/100
12 - 14 yrs.	80 - 90 lbs.	Grain 1/8	Grains 1 1/2	Grain 1/150	Grain 1/75
Adults	90 lbs. or over	Grain 1/8-1/4	Grains 1 1/2	Grain 1/150-1/100	Grain 1/75

Note: 1. Weight and apparent age are better than actual age as guides to dosage.

2. Negro children and apprehensive white children over sixteen months of age should receive the medication order for the next group.

3. Consult the anesthetist before ordering medication for intracranial surgery or where there is any question because of the physical condition of the patient.

(Revised from the table of Digby Leigh in his textbook, PEDIATRIC ANESTHESIA.)



regular hospital procedure.

1. The patient is admitted to the hospital the day prior to the operation. Blood chemistry studies are made, including the following: (1) A leucocyte and erythrocyte count, (2) a hemoglobin percentage, and (3) clotting and bleeding time tests. Urinalysis is also done.

2. The child should undergo a thorough physical examination.

3. Orders are given for the patient to receive no food or liquid the morning of the operation.

4. Premedication is given one hour before the patient is brought to the operating room. It is the author's experience that the patient is more cooperative and the final result is more satisfactory if the operation is scheduled for the first thing in the morning.

Combination of Agents—Formerly it was not considered advisable to keep a child under a general anesthetic agent for a long period of time.⁵ With the agents employed, however, it is possible to keep the patient under anesthesia for two hours, and possibly more, without ill effects. During this prolonged and comfortable anesthesia, all the dental treatment necessary can be performed. The patient is completely relaxed with no evidence of struggling.

⁵Album, Manuel M.: Dental Care in Cerebral Palsy, Pennsylvania D. J. 16:No. 9, 349 (December) 1949.

1. Induction stage of anesthesia, using a mixture of cyclopropane, nitrous oxide, and oxygen. The patient is carried with this combination for several breaths.

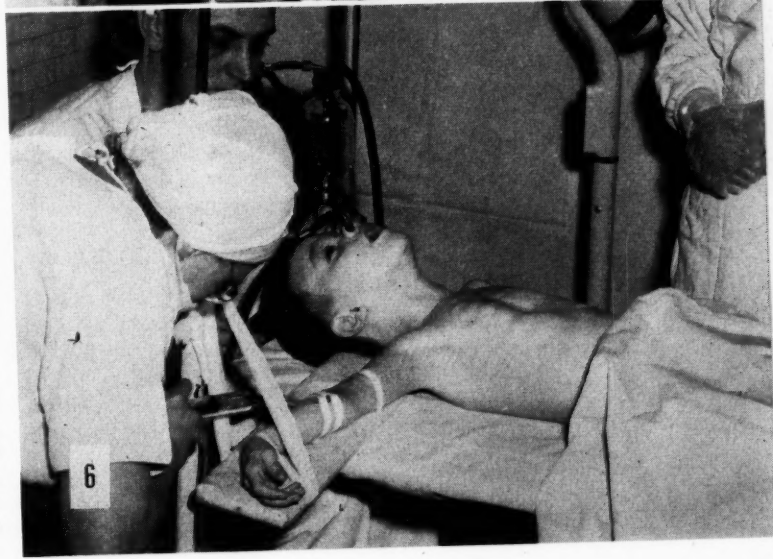
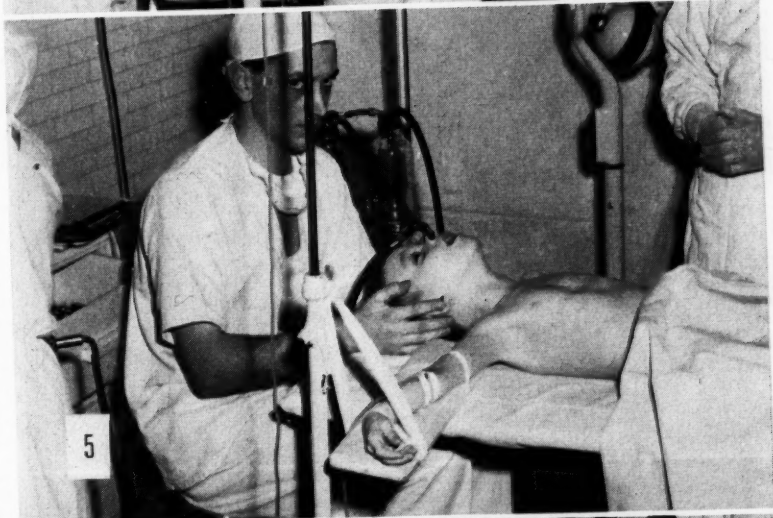
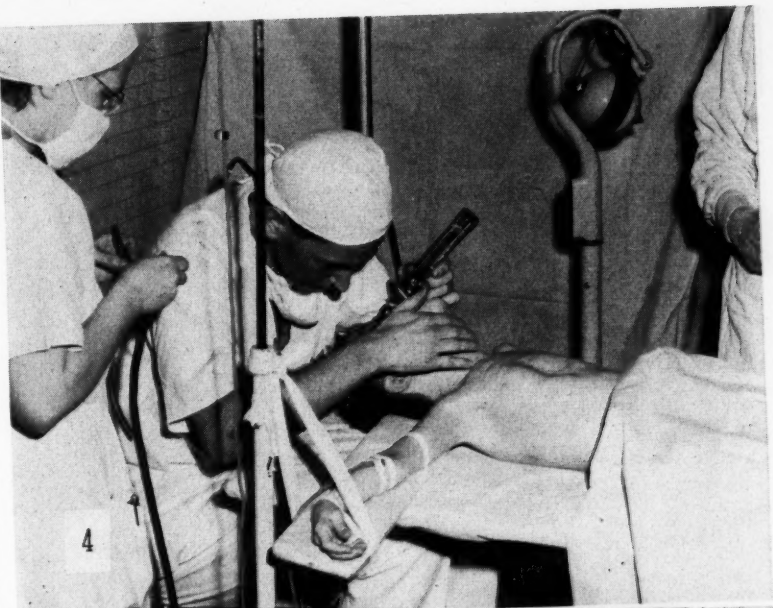
2. The patient is now receiving a mixture of cyclopropane, ether, and oxygen. The nitrous oxide has been discontinued. Note that the patient is also receiving a 5 per cent solution of glucose intravenously. The dental engine is never connected during this step or the preceding stage, because of the danger of creating static electricity.

3. Rubber tubing of proper size is inserted through the nose to the trachea.

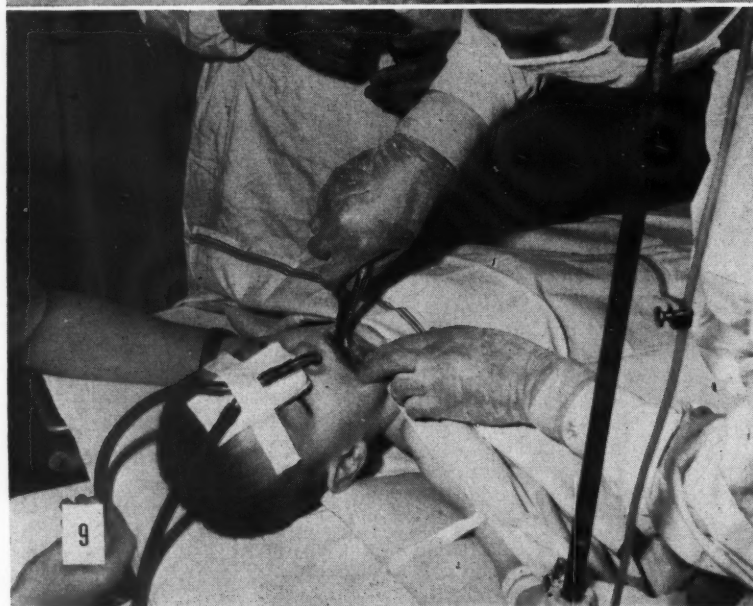
Important Factor—When utilizing this anesthetic procedure, the dental engine must not be plugged into the wall socket or connected to the extension cord until the anesthetist has switched over to the final administration of nitrous oxide. This is done to prevent static electricity created by the dental engine coming in contact with one of the combustible anesthetic agents.

Method of Induction

1. Anesthesia is started with a combination of nitrous oxide, oxygen, and cyclopropane (Fig. 1). The patient is carried along with this combination for several inhalations. The nitrous oxide is then stopped.
2. Ether is now added to the mixture of cyclopropane and oxygen (Fig. 2).
3. A 5 per cent solution of glucose is given by the intravenous drip method (Fig. 2).
4. At this time the anesthetist should intubate the child with the proper length of rubber tubing nasally (Fig. 3). A laryngoscope will enable the anesthetist to determine whether the rubber tubing is correctly inserted into the trachea (Fig. 4).
5. A "Y" attachment is now added to the outer tip of the tubing. This arrangement will provide a constant airway in addition to giving smooth anesthesia.
6. The cyclopropane and the ether should now be discontinued and the patient given a mixture of nitrous oxide and oxygen (Fig. 5). At this



4. A laryngoscope is used to ensure that the tubing is properly inserted. The "Y" attachment is held ready for use.
5. The "Y" attachment is joined to the tubing and the patient is receiving a mixture of nitrous oxide and oxygen. The cyclopropane and ether have been discontinued. At this stage the dental engine may be connected.
6. The patient is now receiving a mixture of pentothal sodium and curare consisting of 25 milligrams of pentothal and 2.5 units of curare. This mixture is given as often as necessary for relaxation during the operative procedures.



time the dental engine should be connected and preparation and restoring of the teeth begun. When the restorations are completed, if extractions are planned to rehabilitate the mouth, the patient can be carried on a combination of nitrous oxide, oxygen, and pentothal sodium and curare; or, if the anesthetist does not wish to use this method, the dental engine can be disconnected and the patient carried on cyclopropane, ether, and oxygen.

7. Pentothal sodium and curare, calculated according to the weight of the patient, is injected into the tubing near the point of entrance of the needle into the vein (Fig. 6).

Control of Relaxing Agents During Anesthesia—Pentothal sodium and curare solution is given at intervals throughout the operation. It is important to bear in mind that these agents are not benign and that administration should be done *only* in the hospital and *only* under intratracheal anesthesia.

Method to Determine Dosage—The curarizing dose consists of $\frac{1}{2}$ unit of d-Tubo-curare per pound of body weight in every 5 cubic centimeters of solution of $2\frac{1}{2}$ per cent pentothal sodium. For a curarizing dose of this strength to be effective the patient must be under anesthesia.

Calculation Based on Body Weight: This dose of $\frac{1}{2}$ units of curare per pound of body weight in every 5 cubic centimeters of solution of $2\frac{1}{2}$ per cent pentothal sodium is maintained up to 50 pounds. Above 50 pounds, the dose calculated for 50 pounds is used on all patients irrespective of their weight or age. This solution is called Baird's solution.

Dosage Individually Calculated: There is no such thing as a stock solution of curare and pentothal sodium. Every patient must have his solution calculated and made up individually prior to the induction of anesthesia.

Use of Hemostatic Agent—Operative treatment can be performed with-

7, 8, and 9. Operative and surgical treatment are being performed. Note the close-up of the "Y" attachment.

out stress for the patient or the dentist. Surgery should be done last as bleeding might obscure the field of vision (Figs. 7, 8, and 9). If clotting or bleeding presents a problem, one of the hemostatic agents, such as oxycel, gel-foam, or hemo-pak, should be used. Suturing can also be done when surgery is completed (Fig. 10).

Final Measures

After treatment the patient is made presentable before he is returned to his room (Fig. 11). A vitamin K preparation, such as synkayvite, may be given intramuscularly to control bleeding. A dose of 10 milligrams will produce satisfactory results in borderline cases or where postoperative bleeding might be anticipated.

Aspiration of Debris—After treatment is completed, a tube is inserted through the free nostril into the pharynx and stomach and any debris that might have lodged there is aspirated (Fig. 12).

Care of Intratracheal Tubing—Irritation and infection in the trachea can occur if the rubber tubing is not absolutely sterile when intratracheal tubing is used. The following is a method for sterilizing the tubing:

1. Wash the tubing thoroughly inside and out with soap and water.
2. Soak the tubing for thirty minutes in a 1:250 solution of formalin and 70 per cent alcohol.
3. Place the tube in the old-fashioned type of steam boiler and sterilize it. It should remain in the water for five minutes after the boiling point is reached. This will eliminate any formalin that might adhere to the sides of the tubing.

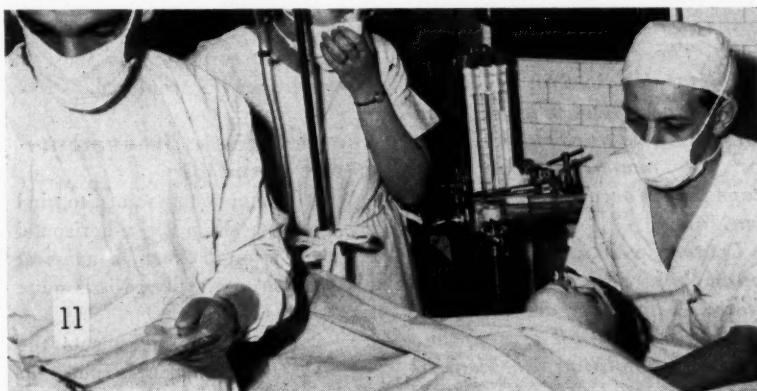
4. The tubing is hung up to dry and left in readiness for use (Fig. 1).

Use of Ether Alone—For short surgical operations, ether without other agents can be administered. The open drop method is used; the after-effects are few and recovery is rapid. Should complications develop during anesthesia, application of the anesthetic agent should be stopped and oxygen, air, or any of the resuscitating drugs should be administered.

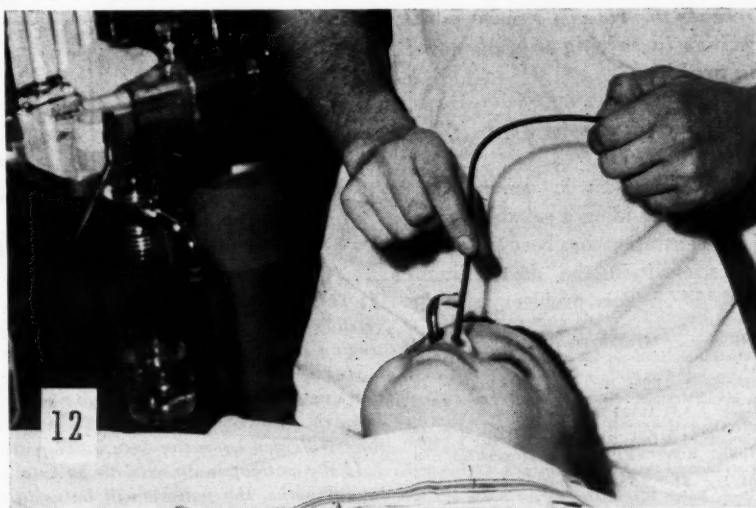
(Continued on page 309)



10. Suturing of the wound. The socket has been packed with oxycel.



11. The patient is shown after treatment is completed.



12. A nasal tube is introduced into the nose to the pharynx and stomach and any debris that has lodged there is aspirated.

CENTRIC JAW RELATION

VICTOR H. SEARS, D.D.S., Salt Lake City

DIGEST

Of all the steps in denture construction, that of finding and recording the centric jaw relation seems to be the most generally baffling one. However, this phase of denture construction should not, and need not be unduly difficult. There are only two simple problems involved: (1) finding a suitable vertical, and (2) finding a suitable horizontal relation for the mandible. These two steps in procedure are important.

Centric relation should be found before the teeth are occluded. The term eccentric jaw relation means "off center" and denotes a condition that dentists should recognize in order to guard against it. This article is an exposition of the basic problem of centric jaw relation and presents the role of needle point tracings in solving this phase of the problem.

Two Problems in Jaw Relationship

1. The problem in denture construction of finding a suitable degree of jaw separation has been thoroughly discussed in the dental literature.^{1,2,3,4,5,6} This problem must be

solved before finding the horizontal relation. By common consent "centric relation" is a horizontal designation.

2. The second problem in jaw relationship is that of finding a suitable horizontal relation. This has confused a great number of readers which is not surprising as many of the writers are also confused.

Characteristic Movements of the Mandible

What the operator wants to find is a single position on a horizontal plane. He cannot afford to guess at this position, especially as it is quite easy to be sure.

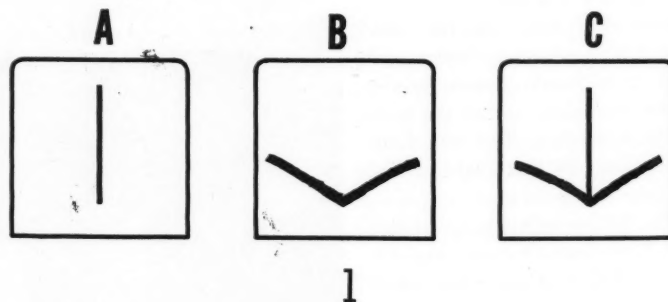
In its horizontal movements the mandible can be made to move in various directions somewhat like the

Ouija board. But as the jaw positions are restricted by the tissues around the condyles, the normal mandible is limited to certain characteristic movements.

Needle Point Tracing Device—If a smudged horizontal plate is mounted on the upper base and a needle point on the lower one so that it slides freely on the plate, the needle point will make characteristic markings. As the needle makes the markings on the plate, it can be seen that each movement has its own particular significance.

Successive Movements—If the mandible is moved in a straight forward direction, the pattern will be a line as in Figure 1A. Actually, the operator can be fairly certain that the mandible is all the way back and in the right-to-left center when the needle point lies at the back end of the line.

Use of Two Lines—However, the



1. If the patient is made to move the mandible into protrusion and quickly retrude it all the way, the needle point will lie at the posterior end of the tracing shown in A. Centric relation can thus be recorded with a single tracing.

As there is some uncertainty that the mandible is retruded fully when only the single line is used, it is more accurate to have the patient scribe two lines from the two condyle centers. Then the pattern would be as in B. This is sometimes referred to as the "sea gull" pattern.

If the patient is directed to go into protrusive as well as into right and left lateral paths, the pattern will be as in C. With the side lines as in B, there is no special need of making the protrusive line, but the record is most easily made if the patient first protrudes, then retrudes, and finally moves to the side. It is for this reason that all three lines, as in C, are usually taken.

¹Niswonger, M. E.: Obtaining the Vertical Relation in Edentulous Cases, J.A.D.A. 25:1842, 1938.

²Thompson, John R.: The Rest Position of the Mandible and Its Significance to Dental Science, J.A.D.A. 33:151 (Feb.) 1946.

³Brenner, George R.: A Functional Denture Technique, J.A.D.A. 27:1873-1883 (Dec.) 1940.

⁴Gillis, Robert R.: The Determination and Registration of the Denture Space, J. Ohio State Dent. Soc. 21:123-131 (August) 1947.

⁵Boos, Ralph R.: Intermaxillary Space Established by Biting Power, J.A.D.A. 27:1192-1199 (Aug.) 1940.

⁶Burtenshaw, G. H.: The Importance of the Vertical Division, New Zealand Dent. J. 44:215 (January) 1948.

operator can not always be sure of this retruded position if only the one line is used. If the mandible is carried first to the right side and back and then to the left side, the tracing will resemble Figure 1B. Then if the mandible moves successively into protrusion, right and left lateral relations, the pattern will be similar to Figure 1C.

Tissues Act as Stops—The scribing of arcs occurs because the tissues just back of the condyles act as stops. When both condyles meet their stops, the needle point can move from here to the right (and back) only until the left condyle again meets its stop. It can move also to the left (and back) only until the right condyle again meets its stop.

Early Descriptions of Intersecting Arcs—This phenomenon of right and left intersecting arcs from right and left condyles was known and fully described and illustrated by F. H. Balkwill in 1866.⁷ The first needle point tracing device for applying this knowledge in denture construction seems to have been introduced by Hesse in 1897,⁸ and given greater prominence by Gysi about 1910. With the needle point tracer known for more than half a century it seems strange that the device is not more generally understood and more generally used.

Figure 2—Copied from the original drawing used by Balkwill in his paper, Figure 2 shows clearly that he understood the principle of the needle point tracer although there seems to be no record of his having actually constructed one.

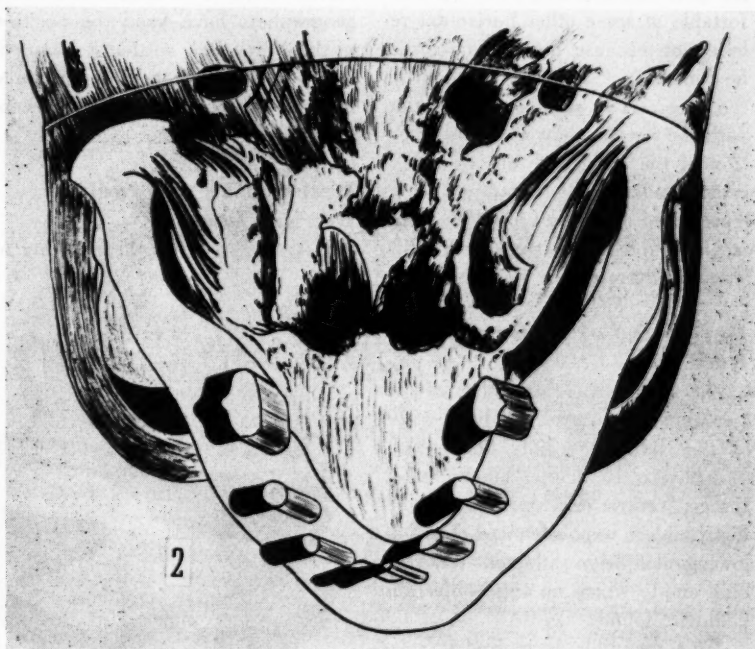
Figure 3—The principle of intersecting arcs for fixing rotation centers is shown. Here the rotation centers are elbows instead of condyles, but the arcs are similar.

Position Located on Horizontal Plane—The only lines needed for finding centric jaw relation are those shown in Figure 1B. When the needle point rests at the intersection of these lines, both condyles are against their

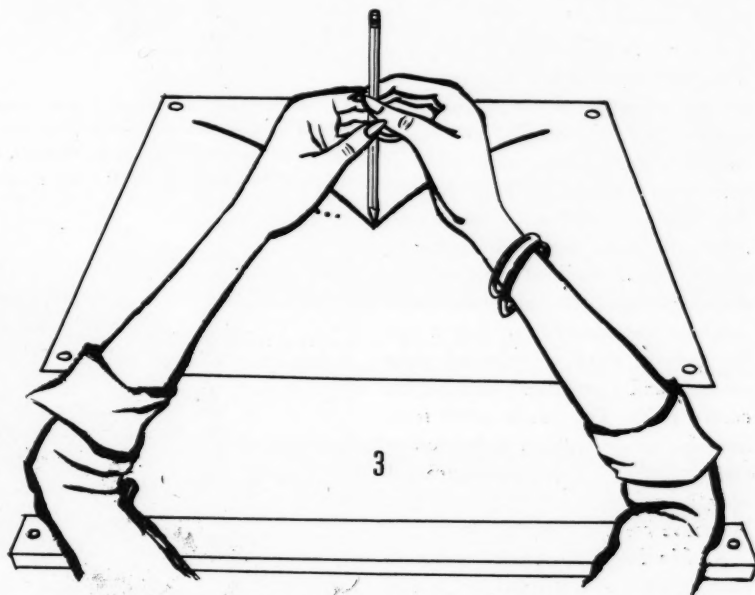
stops and the mandible is in centric relation.

Centric Relation Represented by a

Point—As yet, there is no question of whether the teeth should later be set to this centric relation; a position on



2. In this illustration Balkwill uses only the paths around the condyle centers as in Figure 1B. They are, of course, the most important ones.



3. When both elbows rest against the crosspiece fixed to the drawing board, the pencil point is in centric relation. When only the left elbow advances, the pencil point describes an arc around the right elbow as shown. This results in right lateral relation. When the left elbow becomes the center of rotation left lateral relation results. If both elbows were advanced, protrusive relation would result.

The condyles of the mandible move in arcs in a similar manner, and cause the needle points of the Trivet to describe arcs similar to those made by the pencil point held in the hands.

⁷Balkwill, F. H.: The Best Form and Arrangement of Artificial Teeth for Mastication. Read before the Odontologias Society of Great Britain, June 4, 1866. Reprinted by Rudolph L. Hanau in *Hanau Intraoral Method*. Private printing 1927.

⁸Bergstrom, Gunnar: On the Reproduction of Dental Articulation by Means of Articulators, *Acta Odontologica Scandinavica* 8:4, 1950.

the horizontal plane is the problem here. Those who maintain that this is not true centric relation because the patient's mandible is more comfortable at some other horizontal relation or because the mandible can be forced back farther, only confuse the issue. It is still centric relation with the needle point at the intersection of the right and left arcs. It is centric relation by definition. It is represented by a point and this point can be found by the same or by different operators, time after time.

Definition of Centric Relation

The author was a member of the committee appointed in June 1929 by the National Society of Denture Prosthetists to define, among other things, "centric relation." Many conflicting ideas were advanced. The following definition adopted was the only one to which no valid objection could be found:

"The mandible is in centric relation when the heads of the condyles are in their most retruded positions from which the jaw can make free lateral movement."

Use of Needle Point Tracings—This definition makes it possible to use the principle of intersecting arcs as described by Balkwill. It is necessary only to mount a needle point at some convenient place inside or outside the mouth so that the jaw movement will cause the needle point to travel over a smudged plate to produce tracings. Attaching a needle point on the mandible so that it can be made to mark a horizontal plate on the maxilla provides a definite reference point. The needle point tracings are made without reference to closing force.⁹ They are significant only as related to positions of the mandible on a horizontal plane.

A Fixed Point—Some operators may choose a protruded or lateral relation at which to arrange the teeth. The eccentric jaw relation at which teeth can be arranged in no way alters the existence of the point as we have defined it. A geographer might

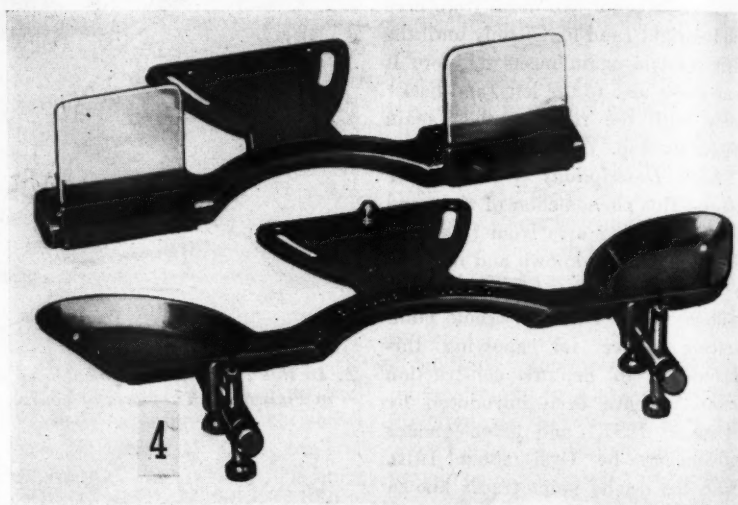
select some point of reference in Baffin Bay, but he cannot logically maintain that this point is his idea of the North Pole. By common consent geographers have fixed the position of the North Pole so that it is a definite point of reference. Centric relation, as defined herein, is likewise fixed.

Description of Tracing Devices Used

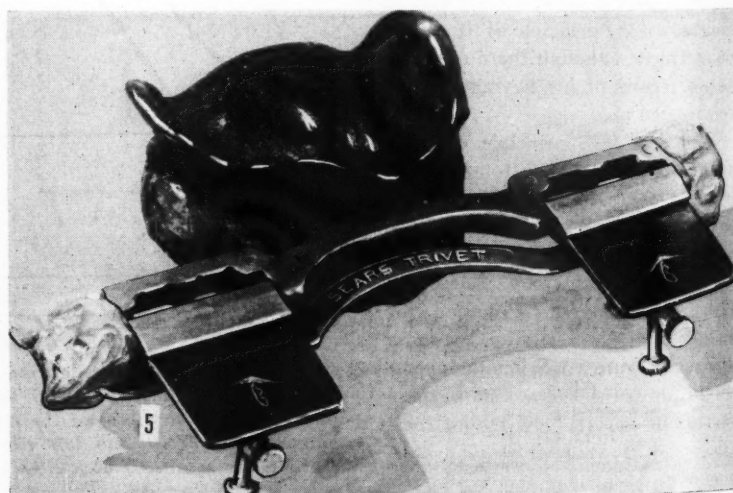
Having agreed on the meaning of

centric relation, a suitable tracing device may be selected to make the practical application of the principle of intersecting arcs. There are available many different tracing devices that can be used. Only two will be discussed here, (1) the Recording Trivet¹¹ which embodies the central bearing point, and (2) the Centre-cord¹² which uses multiple bearing

¹¹Hanau Engineering Company, Buffalo, New York.
¹²Opatow Dental Manufacturing Corporation, Brooklyn, New York.



4. The upper and lower Trivet members shown here are to be attached by means of hot modeling plastic to the upper and lower baseplates so that only the lower bearing post is in contact with the upper member. The glass plates are then smudged to receive the tracings.



5. Here the smudged glass plates have rested on the needle points to receive the tracings. The needle points lie at the intersections of right and left tracings.

⁹Report by the National Society of Denture Prosthetists, J.A.D.A., 1122 (June) 1930.

¹⁰Sears, Victor H.: To Bite or Not to Bite, Dental Items of Interest 62:670-675 (July) 1940.

points. Each device has its virtues but regarding centric relation there is no difference of principle in the two types.

Advantages—Both Trivet and Centrecord have an advantage over many of the other devices in that the tracings are at all times visible. Visibility makes it possible to know whether the mandible is in centric relation at the time the upper and lower bases are being locked together.

Figure 4—The upper and lower members of the Trivet are shown. The upper member carries hinged glass plates on which the lower needle points make their tracings.

Figure 5—The Trivet with the record completed and ready for transfer to the articulator is shown. Two needle points make the tracings which are at all times visible. Only the right and left arcs made by the movements of the mandible are significant in fixing centric jaw relation.

Protrusive Eccentric Movements: The other markings lying in the angle represent some of the protrusive eccentric movements. Plaster of Paris is used at the ends of the Trivet members to fix them together while the needles show that the mandible is in centric relation. The single bearing point mounted at the center of the lower member makes free movement on the upper member as the patient moves the mandible.

Casts Mounted: With the upper and lower members held together firmly by means of the plaster of Paris, the casts are placed into their baseplates and thus mounted in centric relation on the articulator.

Figure 6—The lower Centrecord member is mounted on the lower baseplate.

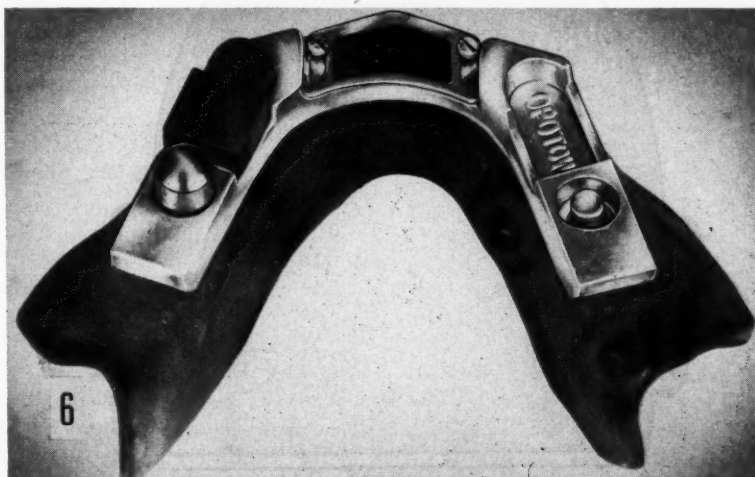
Figure 7—Both upper and lower Centrecord members on their baseplates are shown in the patient's mouth and with the mandible in centric relation as proved by the needle point tracing.

Figure 8—The same view as Figure 7 except that the upper member has been removed from the mouth to show the needle point tracing.

Centric Relation Record—With both upper and lower members in

place, the wells in the bicuspid regions at the sides of the lower member are filled with warmed modeling

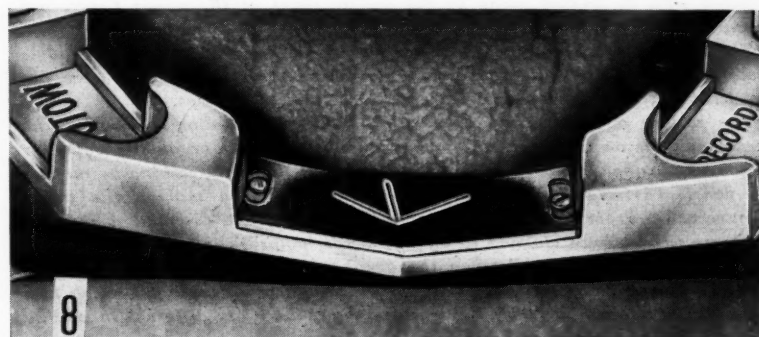
plastic and the patient is directed to close and hold the jaws together with the needle point at the apex of the



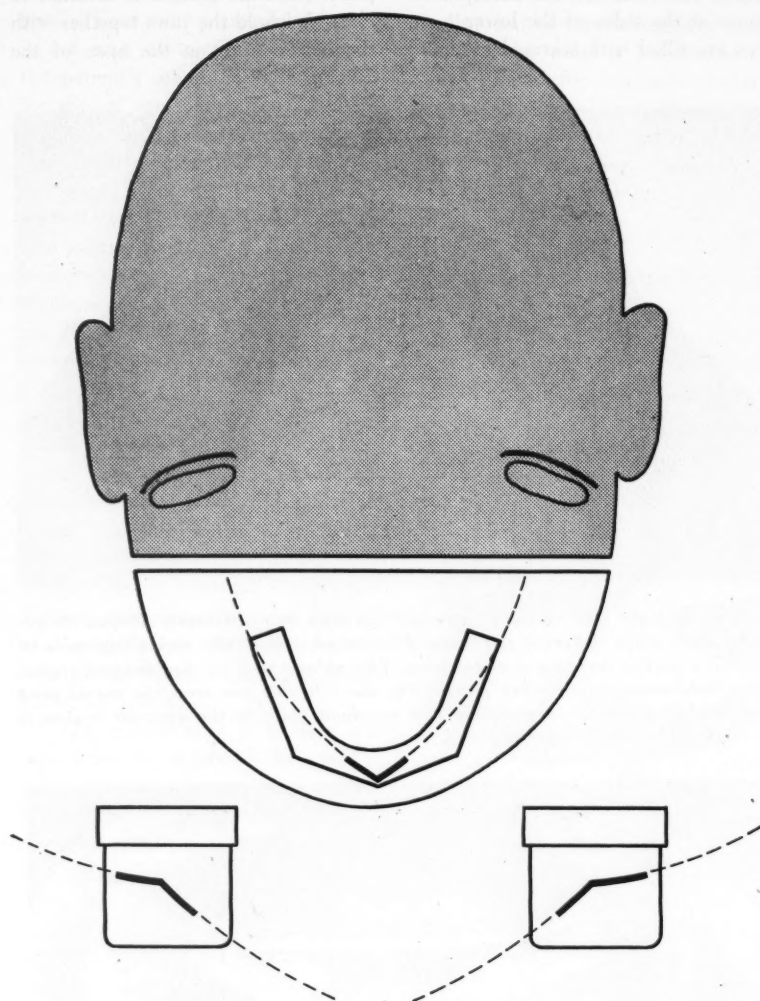
6. On the right side of the Centrecord are seen two differently shaped empty wells. They serve different purposes. The round well in the molar region is to receive a spring carrying a metal plug. The oblong well in the bicuspid region is to hold warmed modeling plastic. On the left side are seen the metal plug and modeling plastic in position. The smudged plate in the anterior region is to receive the needle point tracing.



7. Modeling plastic is here removed to show how the load is carried by the metal plugs in the first molar regions. The needle point on the upper Centrecord member makes bare contact with the lower metal plate.



8. The needle point tracing is here shown more clearly than in Figure 7.



9. The top view is at two levels, the higher or shaded section is at the condyle heads; the lower section at the level of the occlusal plane. In the higher section are seen the outlines of the condyles and just back of them the stops. The stops are the tissues in the posterior parts of the glenoid fossae.

The right and left square outlines in front of the head represent the right and left glass plates of the upper member of the Trivet. The markings made by the needle points of the lower Trivet member are seen on the glass plates. The outline within the head at the lower level represents the lower Centrecord member with its tracing made by the needle point of the upper Centrecord member (not shown.)

The dotted lines indicate continuations of the arcs around the condyle centers. The patient could make these longer arcs if the condyles were not restricted in the distance they can travel away from their stops.

The pattern of the tracing is somewhat different according to whether the needle point is on the lower or moving member (Trivet) or on the upper or stationary member (Centrecord). The difference is similar to writing by moving the pencil (Trivet) or by holding the pencil still and moving the paper (Centrecord). From the practical standpoint there is no essential difference, but some writers have claimed to see an "arrow point" when the needle point moves and a "Gothic arch" when the graph plate moves. No imagination is needed if either pattern is designated as a "needle point tracing," which is a more accurate term. Certainly the tracings shown here are different in outline from the outlines of the arches used by the Goths.

tracing until the modeling plastic sets. This produces a centric relation record with measured resistance at right and left first molar regions. The resistance is produced by the two metal plugs on springs.

A Composite Picture—Figure 9 is a view obtained with the observer standing behind and above the patient's head. The shaded part is a horizontal section through the condyle heads. Anterior to this is a horizontal section at the level of the occlusal plane. This is a composite picture showing the tracings as made both with the glass plates of the Trivet and the metal plate of the Centrecord.

Comments

1. The use of a needle point tracing device for finding centric jaw relation as described is completely scientific. Few steps in denture construction compare with this from the standpoint of simplicity and exactness.

2. Suggestions on how to obtain the necessary records quickly are presented elsewhere.¹³

3. The actual chair time is short. The technique itself is simple, and incidentally, it is impressive to the patient.

4. The laboratory procedure in mounting the tracing device can be done either by the technician or the dentist.

Conclusion

It is clear from this presentation that the mounting of casts in centric relation need not be guesswork. By the proper use of the needle point tracing device, both technician and dentist can proceed with the assurance that there is no danger of "missing the bite."

Tribune-Telegram Building.

¹³Sears, Victor H.: *Principles and Technique for Complete Denture Construction*, St. Louis, C. V. Mosby Company, 1949.

The Uses of Terramycin

IN DENTISTRY

HARRY MAETH, D.D.S., Mosinee, Wisconsin

DIGEST

This article reports the results of the use of terramycin in a trial series of dental procedures which include the management of cellulitis of dental origin, treatment of exposed pulps, postoperative treatment, and pulpotomy in deciduous molar teeth, as well as other situations. The excellent results obtained from the use of the antibiotic by the author of this article would indicate that the agent has definite promise as a useful drug in surgical procedures.

Description of Antibiotic

Terramycin is a new antibiotic produced by the growth of the mold *Streptomyces rimosus*.¹ Discovered in 1950, this antibiotic is a bright yellow crystalline substance which is amphoteric in nature. Terramycin and terramycin hydrochloride are stable at 25 degrees Centigrade. Crystalline terramycin hydrochloride will maintain its potency for twelve months when stored at room temperature.

Hydrochloride Preferred—Because it is more rapidly absorbed and produces higher serum levels, the hydrochloride is employed in preference to the amphoteric form.

Methods of Administration—Although this drug may be administered

by injection, the oral route is more frequently employed. Topical or local applications have also been made in some of the procedures herein reported.

Variety of Uses

Terramycin is effective against a wide spectrum of organisms, including many aerobic and anaerobic gram-positive and gram-negative bacteria, the spirochetes, the rickettsia, and certain viruses. This antibiotic is of special value in the treatment of those infections which are resistant to penicillin and streptomycin.

Oral Dosage—The oral dosage is 2 to 3 grams daily, given fractionally every four to six hours. The dosage will vary with the type and severity of the infection and the age of the patient.

Use in General Surgery—In general surgery terramycin has been found extremely effective in the treatment of infections.² The function of antibiotics is protection against invasive infection into contiguous structures incident to extirpation of the focus of infection.³

Value in Dental Procedures—In view of the basic surgical consideration, and the impressive record of the management and treatment of infections encountered in general surgery, terramycin was considered desirable for trial in the following procedures:

(1) Cellulitis of the facial tissues of dental origin, five cases.

(2) Maxillary sinusitis as a postoperative complication to dental surgery, one case.

(3) Postoperative treatment, twenty-eight cases.

(4) Treatment of exposed pulps, pulp capping, twenty-six cases.

(5) Pulpotomy in deciduous molar teeth, nine cases.

(6) Treatment of exposed pulp, with evidence of root end lesion (suggesting chronic inflammation), one case.

(7) Pericoronal infections of lower third molars, two cases.

Treatment in Cellulitis

Four of the five cases of cellulitis of the facial tissues were secondary to one or more carious broken-down teeth. Considerable hard swelling from the lower border of the mandible to the infraorbital area with closure of the eye prevailed in common. Temperature ranged from 99.4 degrees to 103.2 degrees, with pain and trismus. Terramycin was given orally, 500 milligrams, every four to six hours.

Case History—One of the cases of cellulitis that was of particular interest was that of a white male, aged 20, first seen on April 9, 1952.

Symptoms—1. The patient presented a hard nonfluctuant swelling of the left side of the face. This swollen mass extended from the inferior border of the mandible to the infraorbital ridge. 2. There was partial closure of the left eye, severe pain, and trismus. 3. A temperature of 103.2 degrees was recorded orally. 4. There was considerable intraoral swelling at the buccal site extending

Author's Note: The terramycin used in this study was supplied by Chas. Pfizer & Co., Brooklyn, New York.

¹Regina, P. P., and Solomons, I. A.: The Chemical and Physical Properties of Terramycin. Ann. N.Y. Acad. Sc. 53:229 (Sept. 15) 1950.

²Pulaski, E. J.: The Place of Antibiotics in the Field of Surgery. Ann. N.Y. Acad. Sc. 53:347 (Sept. 15) 1950.

³ibid. 53:352 (Sept. 15) 1950.

from the left maxillary cuspid to the first molar, no fluctuation.

Terramycin Given—The patient refused hospitalization. Terramycin was given, 500 milligrams every four hours. Ice packs were applied every hour for about fifteen minutes, and saline mouth rinses were used.

Progress of Case—1. April 10 the temperature was recorded at 100.2 degrees and the facial swelling had almost subsided. 2. The intraoral swelling now showed fluctuation which permitted incision and drainage of about 15 cubic centimeters of purulent fluid. 3. April 11 the temperature was normal, trismus and swelling had subsided. 4. The offending tooth was removed under local anesthesia. 5. Terramycin was administered at the same level up to the time of tooth extraction, and continued for twenty-four hours. 6. The patient's condition was satisfactory, and he was discharged on April 12.

Treatment with Similar Results—The other three cases of this group presented similar clinical pictures and the treatment was carried out in the same manner. No complications were observed and no case in this group ran a course of more than four days.

Case History—The other case of cellulitis of the facial tissues was secondary to the removal of roots of maxillary molar teeth of a white male patient, aged 66. A generalized gingivitis was observed preoperatively.

Medication—Procaine penicillin, 300,000 units, was administered parenterally, plus 200,000 units of penicillin combined with the intraoral local anesthetic solution, preoperatively.

Postoperative Symptoms—Twenty-four hours after the operation there was (1) evidence of an acute inflammatory reaction with massive swelling of the facial tissues including the entire right cheek and extending to the infraorbital ridge with partial closure of the right eye; (2) slight trismus and severe pain, and a temperature of 101.6 degrees; (3) no intraoral swelling; and (4) there was complaint of pain on swallowing.

Terramycin Administered—Penicillin was discontinued; terramycin,

500 milligrams every four hours, was administered for the next two days.

Progress of Case—1. After twenty-four hours of terramycin administration, the temperature had returned to normal and the facial swelling was almost entirely subsided. 2. On the third postoperative day the terramycin was reduced to 250 milligrams every six hours; the patient was discharged on the fourth postoperative day. 3. It appears that the fulminating reaction in this case was caused by some penicillin resistant organisms which became amenable to the terramycin therapy.

Treatment of Exposed Pulp

About 20 milligrams of terramycin hydrochloride was dissolved in eugenol; zinc oxide was then combined in the usual manner to form a thick mass. This mixture was placed directly upon the area of the exposed pulp. Cement was used to seal the treated tooth. Teeth treated in this way have responded favorably and are being kept under observation. One of the teeth so treated, a maxillary first molar, presented two areas of pulp exposure, with slight bleeding. This tooth has continued to be serviceable since January 22, 1952.

Material Freshly Prepared—For the treatment of exposed pulps a mixture of terramycin hydrochloride and zinc oxide and eugenol was prepared fresh for each application. Terramycin HCl is soluble to the extent of 10 milligrams per cubic centimeter of eugenol, and retains 100 per cent of its activity in such a solution at the end of three days.⁴ After storage at 37 degrees Centigrade under the same conditions, in the presence of zinc oxide terramycin HCl retains 95 per cent of its activity.⁴

Cause of Pulp Exposure—Some of these cases were treated without local anesthesia. Bleeding from the pulp was observed in some of the anterior teeth and posterior teeth. The removal of the advanced deep-seated caries was the cause of all of these pulp exposures.

⁴From the research laboratories of Chas. Pfizer & Co., Brooklyn, N.Y.

Treatment for Pulpotomy

The teeth which were treated for pulpotomy with terramycin were deciduous first and second molars in patients ranging in age from five years to eight years. There was no evidence of periapical disease in any of these teeth despite the extensive carious lesions.

Bleeding Controlled—Local anesthesia was used in all of these cases and some of the operations were accompanied by considerable bleeding which was controlled before filling the pulp chamber.

Treatment Procedure Similar—A mixture of terramycin HCl with zinc oxide and eugenol, in the same proportions as stated previously, was again used; cement was used to build up and seal the teeth. No postoperative complication was observed in any of these deciduous teeth.

Terramycin for Postoperative Treatment

In the twenty-eight postoperative treatments terramycin HCl as the dental paste, and the cones were applied.

Method—A cone contains 15 milligrams of terramycin HCl and is placed into the socket. Unabsorbed residual material is removed on the second postoperative day.

Incidence of Dry Sockets—Painful or dry sockets responded favorably to this form of treatment. The medication was placed into the extraction wound and the patients were seen in twenty-four hours. Four of these cases required continued treatment for three days, another five cases were treated two days, while the twenty remaining cases were discharged after one postoperative treatment.

The residual material of the terramycin paste was removed from the sockets. The terramycin cones appeared to be completely dissolved with no residue.

Maxillary Sinus Complication

The patient in this case was a white female, aged 50. A perforation of the inferior wall of the maxillary sinus was observed twenty-four hours post-

operatively to a simple extraction of a bicuspid. There was scant drainage of a thin serous fluid. This condition was accompanied by slight pain, no swelling, and a temperature of 99.2 degrees.

Procedure—The orifice of the extraction socket was freshened and sutured securely. Terramycin was given orally, 500 milligrams every four hours, and continued for three days. The drug was reduced to 500 milligrams every six hours and continued until the sixth postoperative day. The sutures were removed on the fifth postoperative day; the drug was maintained at the same level for another twenty-four hours.

Symptoms Absent—When the patient was discharged, all symptoms

and evidence of the original condition were absent.

Pericoronal Infection

The two cases of pericoronal infection of lower third molars were treated by oral administration of terramycin HCl 500 milligrams every five to six hours.

Symptoms—Trismus, severe pain, submaxillary adenopathy and external swelling, and temperatures of 101 degrees and 102.4 degrees were observed in each of the two cases. External swelling accompanied the case with the temperature of 102.4 degrees.

Treatment Continued—After twenty-four hours of medication the swelling was sufficiently reduced to permit surgery. After the teeth were re-

moved, terramycin was given in reduced doses, 250 milligrams every six hours through the fourth postoperative day. Termination of these two cases was uneventful.

Summary

This limited experience with terramycin reveals a reasonable effectiveness of the antibiotic in certain dental operations without any unsatisfactory side effects. Five years were required to evaluate the sulfonamides, and five years to evaluate penicillin. It is, therefore, premature to define the precise role of terramycin in dentistry but it has considerable promise as a useful drug in surgical procedures.

Mosinee, Wisconsin.

Dental Procedures and General Anesthesia in Cerebral Palsy

(Continued from page 301)

Conclusions

1. The combination of anesthetic substances presented has proved highly successful when it is necessary for the dentist to perform extensive dental work on cerebral palsied chil-

dren. The procedure is well suited to operative dentistry as well as for surgical operations.

2. The procedure outlined will give the best results in treating cerebral palsied children.

3. It must be stressed that although an anesthetic agent is considered safe, it can become a deadly weapon when improperly administered.

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Modern Methods of MANAGING INJURIES of Children's Anterior Teeth

LOUIS B. KELSTEN, D.D.S., Newark, N.J.

DIGEST

In this article, the possible types of injuries which may occur to the anterior teeth of children from automobile accidents, while participating in sports, or from other means, are classified for purpose of treatment. Methods of treatment for each classification of injury are suggested and step-by-step directions given for procedure in each case. Favorable and unfavorable prognosis in each type of injury is presented and methods of replacement are described for instances where a tooth has been knocked out or injured so severely that extraction is necessary.

Correct Diagnosis Essential

In treating traumatized young permanent incisors, the following diagnostic measures should be taken:

1. A history concerning the time and manner of injury should be taken.
2. The fractured teeth as well as those adjacent and opposing should be checked for vitality, mobility, and alignment.
3. The injured teeth should be x-rayed to reveal possible pulp exposure, root fracture, or periapical infection.

Although fractured teeth frequently maintain their vitality, it has been found that teeth in the same area which appear unharmed may be non-vital.

Determining Vitality of Injured

Tooth—An electric pulp tester or a pellet of cotton saturated with ethyl chloride can be used for determining the vitality of the injured tooth. A sharp pain which rapidly disappears upon removal of the pellet indicates that the pulp is normal.

If there is prolonged pain the pulp is in a state of active hyperemia.

Where the tooth does not respond to the test for vitality for several days after the accident the pulp may be in a state of shock and may react normally later.

Time Required for Final Diagnosis

—According to Brauer,¹ a period of three months is necessary before a final diagnosis can be rendered. If the tooth is comfortable and still vital following that period of time, the prognosis can be considered highly favorable.

Classifications of Injuries for Treatment

For purposes of treatment, injured teeth can be classified according to the following types of trauma:

1. Where there has been a chipping of the enamel with little or no involvement of the dentin.
2. Where the fracture involves a considerable part of the coronal dentin but not the pulp.
3. Where the coronal fracture involves the pulp.
4. Where the cervical third of the root is fractured.

¹Brauer, John C.: The Treatment of Children's Fractured Permanent Anterior Teeth, J.A.D.A. 41:399-407 (Oct.) 1950.

5. Where the apical or middle third of the root is fractured.

6. Where the fracture involves a root of a nonvital tooth which may or may not be infected.

7. Where a tooth becomes non-vital although there has or has not been a fracture of the crown or the root.

8. Where a tooth is displaced or loosened.

9. Where a tooth has been completely intruded into the maxilla.

10. Where a tooth is completely knocked out.

Methods for Treatment

As a prophylactic measure because of the possibility of saliva contamination, in a severe injury of an anterior tooth the patient should receive 300,000 units of procaine penicillin G, intramuscularly, within a few hours after the accident. This may preserve the vitality of the tooth or at least prevent an acute flare-up.

Class-1 Injury—All that is required in a Class-1 injury is smoothing the ragged edge of the fracture with a stone and rubber wheel. If the tooth is sensitive to thermal stimuli it can be desensitized with formalin. As a precautionary measure, however, the Class-1 injury should be checked in three months for pulp vitality.

Temporary Protection Helpful—The child may be difficult to treat due to fear caused by the injury. For this reason a technique which requires as little operating as possible should be used for temporary protection of Class-2 and Class-3 fractures. A celluloid or plastic crown form or a stainless steel band can be used

with medicated cement for this purpose (Fig. 2). At the following visit, because the previous treatment was painless, the child will be more cooperative.

Plastic Jacket Not Recommended for Indefinite Use—Because a plastic jacket is usually oversized and has a gingival feather edge, there may be subsequent marginal seepage and a deep overbite when the permanent cuspids erupt into position (Fig. 3). It is therefore inadvisable to use this type of restoration over a prolonged period of time.

Three-Quarter Basket Crown Recommended—Since the size of the pulp and the eruption of a child's incisor make the preparation for a porcelain jacket impracticable, Brauer¹ recommends the three-quarter basket crown following the three-month period of observation:

1. The preparation is limited to the mesial and distal with diamond discs and the removal of sufficient lingual enamel to allow for a gold casting.

2. Where part of the incisal enamel remains, approximately 1 millimeter of it is removed.

3. For additional retention, one or more pins can be used, depending on the type of fracture.

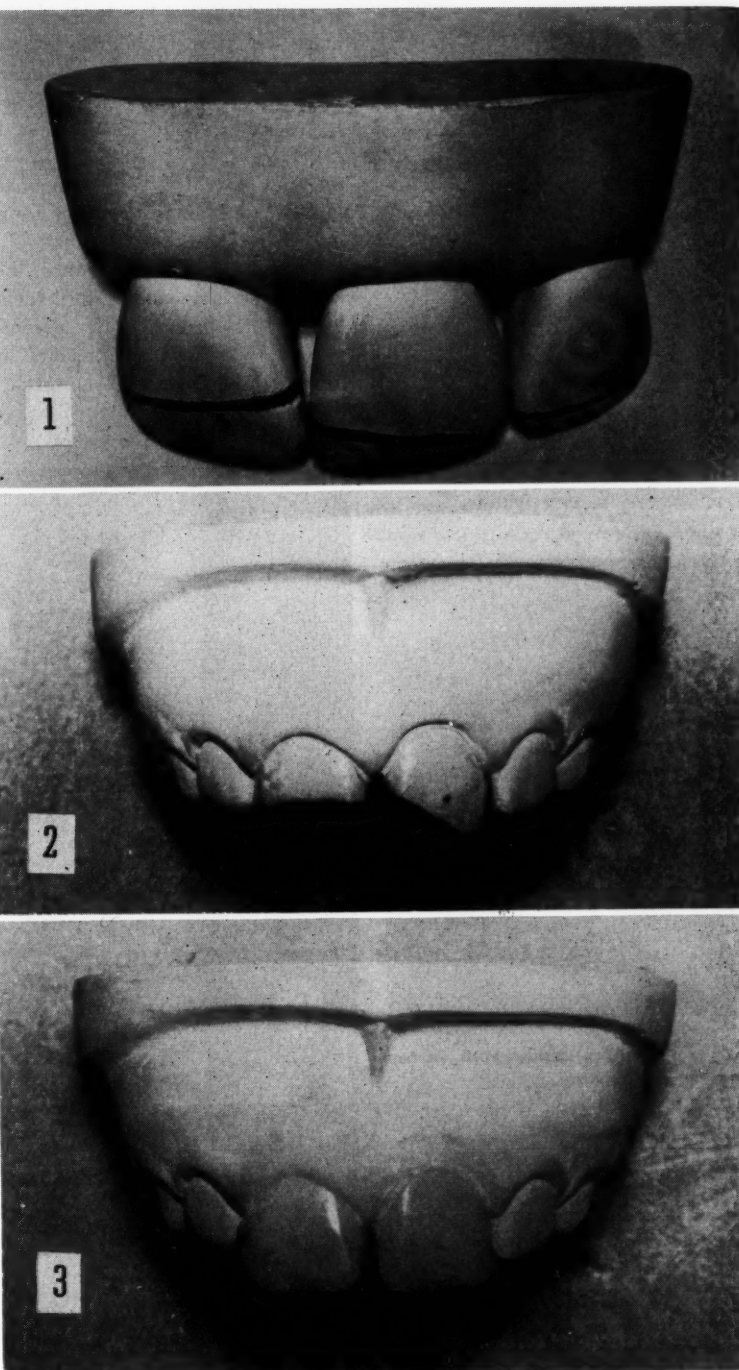
4. To provide esthetics, a labial window is carved out of the wax-up for a silicate in the finished restoration.

Fast-setting Acrylic Restoration—The tooth can be restored with a fast-setting acrylic material using the modified Nealon brush technique. This type of restoration will not interfere with pulp therapy if needed later and can be completed in the following manner:

1. In cases where an incisal corner has been fractured and cutting into the tooth for retention may expose the pulp, an 0.025 wire can be used for stabilization (Fig. 4).

2. With a Number 1/2 round bur in the handpiece a hole is made 3 millimeters in depth and parallel to the pulp. The wire is then bent just beneath the original incisal surface of the tooth and cemented in the hole.

3. After the margins of the fracture are smoothed and a shoulder of



1 millimeter is made at the cavosurface, a stainless steel matrix band is placed about the tooth.

4. The fractured corner is restored with self-cured plastic material using the nonpressure technique.

Pulpotomy Sometimes Necessary—In the Class-3 type fracture where

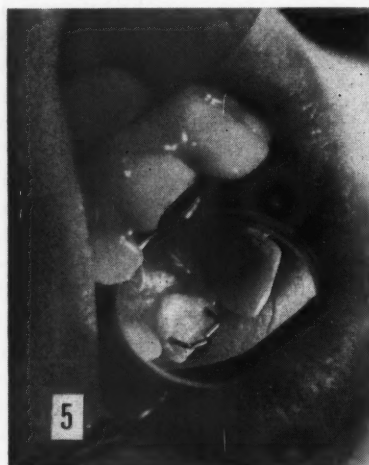
1. Common types of injuries of children's incisors. The lines designate where fractures usually occur.

2. Crown forms used for temporary protection of fractured incisors.

3. Oversized plastic crowns.



4. Use of wire for retention.



5. Use of wires where both incisal corners are missing.

6. Injured incisor before treatment.

7. Restored incisor. For simplicity and esthetics, nonpressure acrylic restorations are highly recommended provided a butt joint margin of 1 millimeter is made.

there has been no history of spontaneous pulpitis or pain at night, the following steps to complete pulpotomy should be taken as soon as possible:

1. After using infiltration anesthesia and isolating the tooth with a rubber dam, an opening to the pulp chamber is made at the gingival third of the lingual part of the tooth with

a sterile $\frac{1}{2}$ round bur in the contra-angle.

2. By increasing the size of the bur until the Number 8 is used, sufficient access to the pulp chamber can be gained.

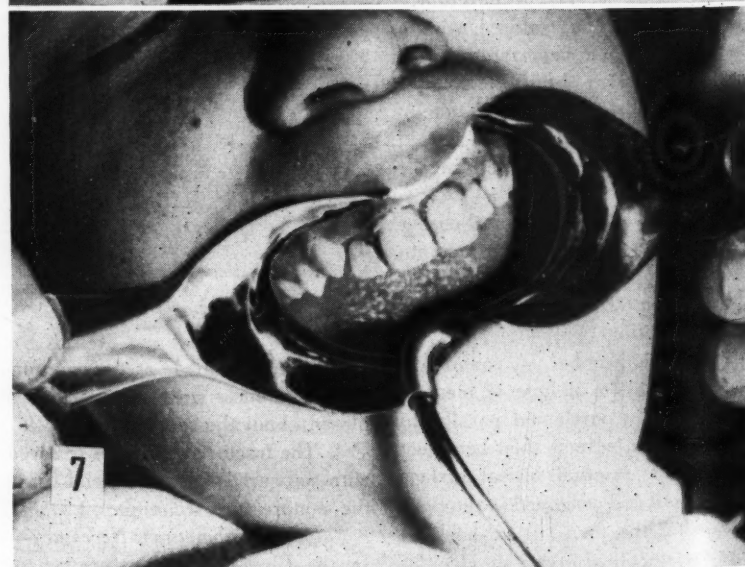
3. To prevent discoloration of the tooth, care should be taken to remove all of the coronal pulp.

Treatment of Hemorrhage—For arresting hemorrhage, a sterile pellet of cotton saturated with adrenalin chloride can be used. Calcium hydroxide, in powder or paste form, is placed over the pulp stump for stim-

ulating the deposit of dentin by the odontoblasts. Zinc oxide and eugenol paste or asbestos paper is placed over the calcium hydroxide to act as a buffer before the tooth is sealed with crown and bridge cement.

Root Canal Therapy—In a fracture where there has been spontaneous pain, the pulp is in an irreversible state of degeneration. The tooth requires root canal therapy. Where the root is incompletely calcified, apicoectomy may also be necessary.

Prompt Restoration Recommended—Should both incisal corners be



missing, two pins can be used for retention and the tooth prepared and restored in a similar fashion (Fig. 5). Class-2 and Class-3 fractures should be restored promptly (Figs. 6 and 7) as there may be a shifting of teeth within a short time with a resultant malocclusion (Fig. 8). A loose cervical fragment can be immobilized with a stainless steel band so that pulp therapy can be applied, if necessary.

Prognosis in Various Types of Injuries

As the result of automobile accidents or participation in sports, root fractures in teen-agers are not infrequent, but a combination of crown and root fractures occurring in the same tooth is rare. Although the cementoblasts and fibroblasts will repair a root fracture, ideal conditions for healing are required. Successful treatment depends upon (1) the vitality of the tooth, (2) absence of infection, (3) extent of the fracture, and (4) the section of the root involved.

Factors Favoring Healing—In a fracture of the cervical third of a root with a loose coronal fragment (Class 4) the prognosis is poor. If the fracture is in the apical or middle third of the root of a vital tooth which has not been displaced by a blow (Class 5) the prognosis is favorable. Where the fractured extremities are separated and there is no infection present, each will be covered by cementum and fibrous tissue will form between them, provided the coronal part is long enough for sufficient periodontal attachment and therefore, satisfactory function.

Mechanical Stabilization Recommended—Where there are (1) root fractures (Class 5), and (2) displaced or loosened teeth (Class 8), mechanical stabilization is recommended for the prevention of pulp degeneration which may occur when the injured teeth are in function and for the promotion of periodontal reattachment and the deposition of cementum and osteoid tissue for satisfactory union of root fragments.

Extraction Sometimes Necessary—In the Class-4 type of injury extrac-



8. Unrestored fractured incisor. Note the shifting of teeth resulting in a marked malocclusion.

tion is frequently necessary because repair will not take place, even with the use of a splint, (1) because of the continuous presence of food debris and saliva which contaminate the area, and (2) because the root cannot be restored properly where the fracture occurs several millimeters above the gingiva.

Healing in Class-6 Type of Fracture—Satisfactory healing can be expected in the Class-6 type of fracture, with or without a root canal filling, provided there is no infection present. Where there is an infected root, the tooth can be saved only by means of root canal therapy with subsequent removal of the apical fragment if it is not too large or if there is sufficient root left for function.

Periodic Examination Required—Prognosis in Class-7 cases is uncertain; these cases should be observed at regular intervals. If the tooth becomes infected, root canal therapy is obviously required. Should root formation be incomplete, apicoectomy may also be necessary because of the difficulty in properly filling the root end.

Unfavorable Indications—Contrary to the theory that it might re-erupt, the tooth with the Class-9 type of injury acts as a foreign body and frequently becomes infected, and therefore, should be extracted.

Class-10 Prognosis Unfavorable:

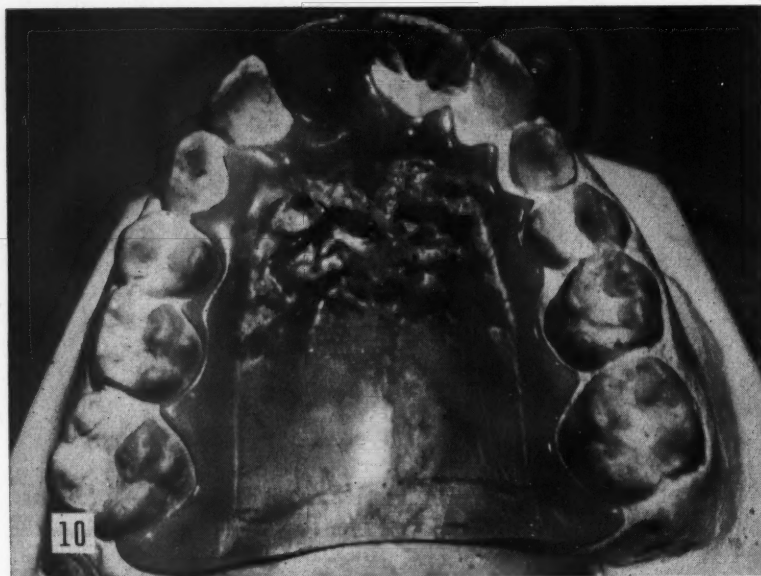
Even though an evulsed tooth is treated with root canal therapy, cleansed, replanted, and then splinted in position immediately following the accident, the prognosis in the Class-10 case is unfavorable.

Occurrence of Root Resorption: In these cases, as Black² states, if the tooth does become firm it is reattached by the formation of cicatricial tissue. Due to the lack of healing by the cementoblasts, resorption of the root frequently occurs in three to five years (Fig. 9).

²Black, G. V.: *Special Dental Pathology*, ed. 2, Chicago, Medico-Dental Publishing Company, 1920, p. 49.



9. Complete root resorption following replantation of tooth.



10. Single tooth partial. Molar buccal arm clasps can be used for added retention.



Additional Methods for Correction

Replacements—In Class-10 and Class-4 cases following extraction, the type of replacement depends upon the patient's rate of growth. Where the anterior teeth are widely separated, as in mixed dentitions, and space closure will not occur until the eruption of the permanent cuspids, a single tooth partial can be used for space maintenance, esthetics, and phonetics (Fig. 10).

Use of Bridge—Where the cuspids are in position and the spaces between the incisors are normally closed, Hartsook³ recommends a cantilever type of bridge in which the central incisor adjacent to the extraction is used as an abutment for a modified three-quarter crown.

Esthetics: The preparation consists of conservative proximal slices in which there are shallow grooves and is brought just short of the incisal surface.

Retention: A lingual pin hole is used for added retention. The casting supports a pontic with a rest fitted into a groove in an inlay seated in the adjacent lateral.

Stainless Steel Bands—In the Class-10 case where an adjacent tooth may also be injured, stainless steel bands 150 by .004, besides protecting the fractured tooth, act as abutments for a temporary orthodontic bridge. A Steele's facing can be soldered to the bands or a strip of band material can be welded lingually to the bands. Loops can be added to support a crown made of self-cured material (Fig. 11).

Splints—In Class-5 and Class-8 cases, after repositioning the teeth with digital pressure if required, splints are necessary as these types of injuries must be treated as any bone fracture. A modification of a splint recommended by Hirschfeld⁴ is the following:

³Hartsook, Joseph T.: Treatment Considerations for the Loss of Children's Permanent Incisor Teeth. *J.A.D.A.* 40:422-423 (April) 1950.

⁴Hirschfeld, Louis: The Use of Wire and Silk Ligatures. *J.A.D.A.* 41:648-650 (Dec.) 1950.

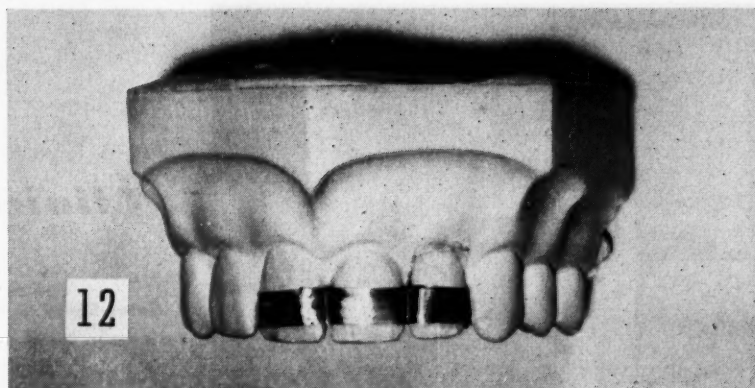
11. Temporary orthodontic bridge with acrylic pontic.

1. An 0.01 stainless steel wire is doubled and extended from the distal of one cuspid to the distal of the other. The ends are joined together and twisted clockwise.

2. Individual wires of the same gauge are placed interproximally just below the contact points of the incisors, running incisally and gingivally to the main arch wire and tightened until the injured tooth is stabilized.

Wire Splints: Hartsook⁵ recommends a splint made of 0.028 stainless steel ribbon arch wire ligated by means of loops of 0.010 ligature wire, gingival and incisal to the arch wire. Here the firm uninjured anterior teeth hold the arch wire in place while the injured tooth is stabilized to the arch wire by a single loop of ligature wire.

Stainless Steel Splints: Another type of splint which can be constructed in a few minutes and adapted with a minimum of discomfort to the child consists of stainless steel band material 150 by .003 welded labially and lingually to two abutment bands made of the same



12. Orthodontic splint.

material for the sound adjacent teeth (Fig. 12). This splint is durable, takes the injured tooth out of occlusion after cementation, and can be removed easily. A splint should be kept in position from six to twelve weeks, depending on the severity of the injury.

Conclusion

Where there are crown and root

fractures in the same tooth, with or without pulp exposure, a combination of the treatments described is required. Because of inevitable infection preventing complete healing, however, it is impracticable to treat a tooth with an exposed pulp that has been displaced or has a fracture in the cervical third of the root.

299 Clinton Avenue.

⁵Hartsook, Joseph T.: Management of Young Anterior Teeth Which Have Been Involved in Accidents, J.A.D.A. 37:562 (Nov.) 1948.

Enamel-Erosive Effects of Grapefruit and Grapefruit Juice

IN A COMPARISON of the erosive effects of various acid fruits and the juices of the fruits it was found that the juices were 3 to 10 times more erosive than the equivalent amount of the fresh fruit. Although these results were not explained, it was pointed out that they were not due to differences in titratable acidity.

Further investigation of the enamel-erosive properties of grapefruit and grapefruit juice disclosed that consumption of grapefruit juice causes considerably greater erosion of the lower molars of rats than ingestion of grapefruit sections with similar juice content and pH. When the

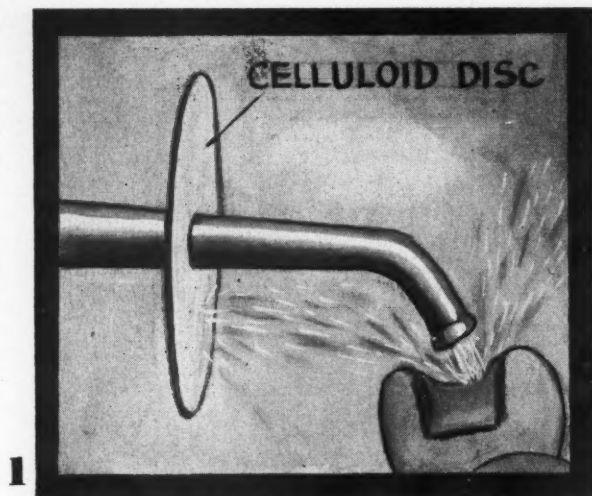
pressed juice was reconstituted into a simulated "fruit" by the addition of 3 per cent bactoagar or 5 per cent foamed, compressed gelatin, these preparations affected the teeth in about the same manner as the natural fruit and were much less destructive than the juice from which they were prepared. This implies that the differences are not due to some protective substance present only in the fresh unpressed fruit, or to some destructive agent arising in the juice during the squeezing process.

By pair-feeding eight completely desalivated rats with litter-mate controls, it was shown that salivary buf-

fering had no detectable influence on the extent of enamel erosion induced by either grapefruit or grapefruit juice and could not explain the different destructive effects of the two supplements.

It is concluded that mechanical differences, such as the consistencies of the supplements and the different manners of ingestion, rather than chemical differences, are responsible for the effects noted.

Adapted from Medical Literature Abstracts, *Journal of the American Medical Association* 149:305 (May 17) 1952.

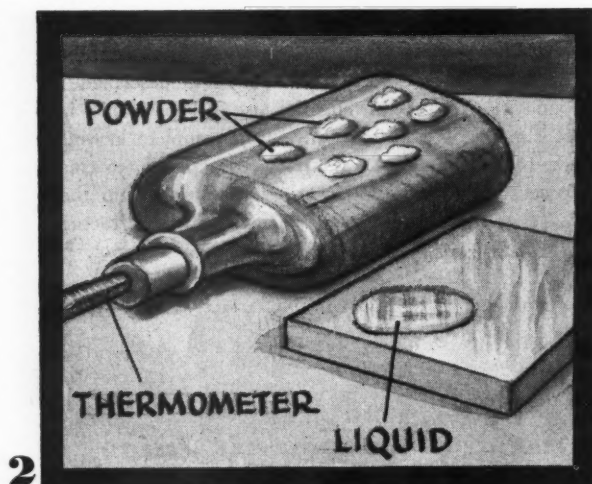


Clinical and Laboratory

Water-Spray Guard

Richard H. Walsh, D.D.S., Bethesda, Md.

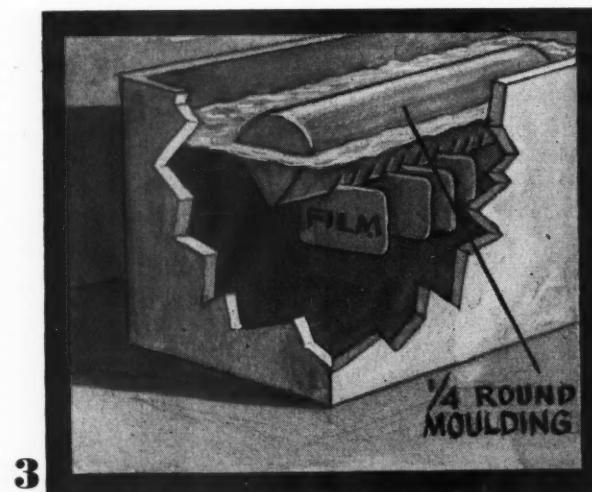
1. Cut a piece of celluloid 2 inches in diameter. Make a hole in the center of the disc. Slide the disc to place on the barrel of the water syringe. This guard prevents reflected spray from striking the operator. Vision is not impaired.



Heating the Polymer in the Nonpressure Technique

Kemper Hur, D.D.S., Dayton, Ohio

2. Fit a thermometer inside a flat bottle. Fill the bottle with water of 160 degrees Fahrenheit temperature. Place the acrylic polymer in small amounts on the glass surface. The heat is sufficient to maintain the polymer at the proper temperature for use in the brush technique.



Emergency Processing Rack for X-ray Films

Lawrence R. Conley, Jr., D.D.S., Buechel, Ky.

3. When in need of an extra film rack use a piece of very soft pine molding. Make cuts $\frac{1}{8}$ inch in depth on the 90-degree angle side of the molding. Films are wedged into the cuts and the rack is floated in the processing solutions. The cuts will tighten when the wood becomes wet, holding the films firmly in position.

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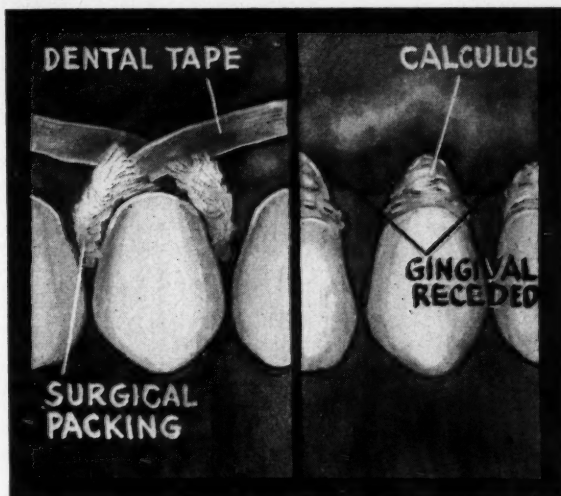
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SUGGESTIONS . . .

A Method of Packing Gingival Tissues

Ward L. Barnes, D.D.S., Lakeland, Fla.

4. Dental tape is impregnated with one of the surgical cement packings. The tape is tied around the tooth at the gingival line. In forty-eight hours the gingival tissue has receded to expose the subgingival calculus which is then easily removed.

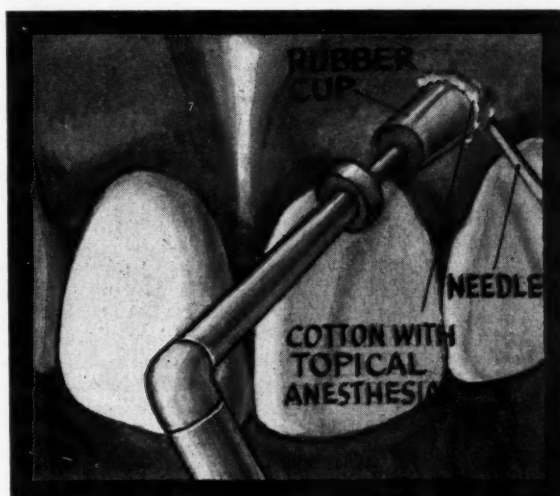


4

Painless Insertion of the Anesthetic Needle

H. D. Graham, D.D.S., Brownsville, Pa.

5. Saturate a pellet of cotton with a topical anesthetic solution and place in the cup of a rubber polisher. Dry the soft tissue and apply the cup to the spot where the needle insertion is to be made. Apply pressure for a minute and then make the injection in the spot that has been topically anesthetized.

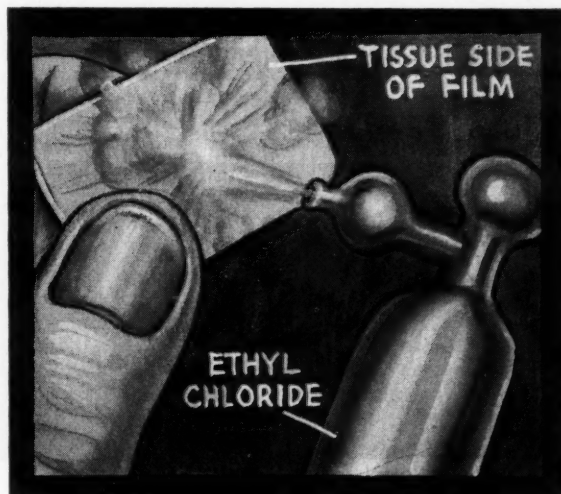


5

Preventing Gagging When Making X-rays

Herbert Alter, D.D.S., Brooklyn, N.Y.

6. To prevent gagging when x-raying a posterior tooth, spray the tissue side of the film with ethyl chloride.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 330 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

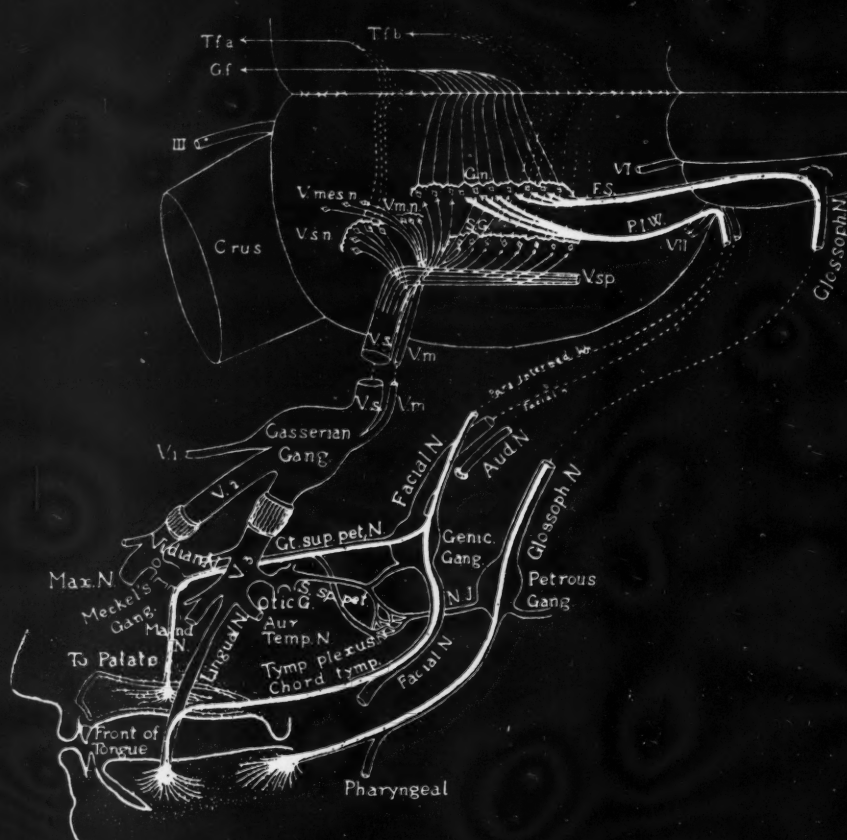


Diagram of the course of the taste fibres (thick lines) and of the intrapontine connexions of the fifth nerve. (The lower half is represented in profile, and the upper in plan. For convenience the gustatory nucleus and substantia gelatinosa are represented in the pons instead of in the medulla.)

- T.f.a.: Trigeminal fillet (tactile and pressure).
- T.f.b.: Trigeminal fillet (pain and temperature).
- G.f.: Gustatory fillet.
- III: Third cranial nerve.
- VI: Sixth nerve.
- V.mes.n.: Fifth mesencephalic nucleus.
- V.m.n.: Fifth motor nucleus.
- G.n.: Gustatory nucleus.
- F.S.: Fasciculus solitarius.
- V.s.n.: Fifth sensory nucleus (tactile and pressure).
- S.G.: Substantia gelatinosa (nucleus of fifth spinal root).
- VII: Roots of the seventh cranial nerve (facial).
- V.sp.: Fifth nerve, spinal root.
- V.s.: Fifth nerve, main sensory root.
- V.m.: Fifth nerve, motor root.
- V.1.: Ophthalmic branch, fifth nerve.
- V.2.: Maxillary nerve.
- V.3.: Mandibular nerve.
- N.J.: Nerve of Jacobson.
- P.I.W.: Pars intermedia wrisbergi.

The chorda tympani and great superficial petrosal (Vidian) nerves carrying taste impressions from the front of the tongue and palate respectively are shown uniting in the pars intermedia wrisbergi. (See Harris, 1926, p. 252.) The glossopharyngeal carries taste impressions from the back of the tongue to the fasciculus solitarius.

The EDITOR'S Page

NOT ALL the pleasures from eating come from taste. Tactile feeling and thermal sensations are equally important. The "feel" and the temperature of the food bolus are as satisfying as the taste. Although the taste buds in the tongue record most of the four basic taste sensations—sweet, salt, sour, and bitter—the nerve endings in the palate must also be considered. To describe food as palatable is more than a figure of speech. In the chewing function the mobile tongue thrusts and presses the food bolus against the palate where pleasurable sensations are registered—tactile, temperature, and taste.

The chorda tympani branch of the facial nerve supplies the taste buds on the top and the sides of the tongue. Another branch of the facial nerve, the great superficial petrosal or vidian nerve, supplies the palate. The glossopharyngeal supplies the back of the tongue. The trigeminal nerve is the mechanism that registers tactile, temperature, and some taste sensations from both the tongue and the palate.

The chart on the opposite page from the *British Medical Journal*¹ shows the complex nervous mechanism involved in taste sensation.

The role of the fifth cranial or trigeminal nerve in the physiology of taste has been debated. The article in the *British Medical Journal* has this to say on the subject:

"The apparent conflict of view on the gustatory function of the chorda tympani and great superficial petrosal (vidian) nerves on the one hand, and of the fifth nerve on the other, is to be explained by assuming that there is a correlation or welding of the sensibility of the tongue and palate supplied by the fifth nerve with the true gustatory sensations from the chorda and petrosal nerves. In normal people taste is therefore perceived through the dual function of normal sensibility of the fifth nerve and the gustatory stimuli supplied by the chorda and vidian nerves. In all cases of total lesion of the chorda and vidian nerves, as may occur in geniculate herpes, or in facial palsy due to a lesion at or above the geniculate ganglion, taste will be permanently lost on the front half of the tongue and palate, the normal sensibility of the fifth-nerve

supply to these parts being quite unable to provide a taste sensation.

"In the great majority of persons a complete lesion of the mandibular and of the maxillary nerves will abolish the tactile, pain, and thermal perceptions of the tongue and palate, and the chorda or petrosal nerves alone may be insufficient at first to arouse the sensation of taste . . . A dual function of fifth-nerve sensibility together with chorda and petrosal gustatory stimuli is generally required."

The physiology of oral digestion includes the mechanical preparation of food by cutting and grinding, the incorporation of the prepared food with saliva for chemical action, the stimulation of nerve end-organs in the mouth for the sensations of taste, feeling, and temperature. We dentists have been so engrossed and preoccupied with the mechanics of oral physiology that we have given only scant attention to the chemical and psychologic processes involved. We have even suffered from myopic vision in some of our mechanical concepts. We have given little attention to the mechanics of tongue and cheek function in the act of chewing. Without the highly mobile muscular organ, the tongue, and without the contractility of the cheek muscles, the finest designed and occluded teeth conceivable would not function with conspicuous efficiency. In the presence of deft and well-coordinated tongue and cheek musculature people often do well with few teeth, with poor teeth, or with no teeth at all.

In the past twenty years no significant contributions have been made that would help us to understand the role of the saliva in caries immunity and susceptibility, that would give us important clues to the oral digestive processes, including any relationships that may exist between the chemistry of saliva and the sensations of taste.

The neurologic aspects of taste are well represented on the chart on the opposite page. The psychologic aspects of taste have scarcely been investigated at all. Tastes do vary among people and in the same person on different occasions. We know little, if anything, of the relationships between dental disease and taste sensations, between dental restorative procedures and taste registration.

¹Harris, Wilfred: The Nervous Mechanism of Taste Sensation, *British M. J. No. 4763:831-836* (April 19) 1952.



Diuretics

The diuretics are drugs used to promote the secretion of urine. They were used originally in medicine primarily to rid the body of hypothetical toxins. Today the chief uses of diuretics are (1) to aid in the elimination of edema fluid from the tissues, and (2) to increase the rate of excretion of waste products.

The production of urine involves the ultrafiltration of the blood passing through the glomeruli with the formation of a relatively protein-free fluid containing all the filtrable constituents of the blood. Approximately 160 liters of glomerular filtrate are formed daily in this process in the average male adult. The daily urinary output is approximately only 1 liter. The remaining 159 liters of glomerular filtrate must be reabsorbed during passage from Bowman's capsule through the tubules.

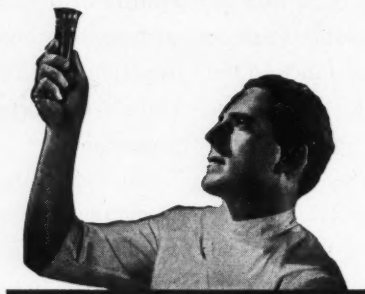
During this passage, the tubules selectively reabsorb many of the constituents of the glomerular fluid in addition to water. Glucose is reabsorbed completely. Sodium and chloride are reabsorbed in amounts which depend on blood concentration. Urea reenters the blood to a lesser extent and other nonthreshold waste products are retained in the urine.

The formation of urine presupposes the availability in the organism of excess water in which the excretory products are eliminated. A competent circulation to permit filtration of blood plasma through the glomeruli and a functionally active tubular epithelium to alter selectively the composition of the glomerular filtrate are necessary. Homeostasis, a constant composition of the blood and tissues, is maintained by a combination of these factors.

Several mechanisms acting on the different parts of the nephron involved in urine formation control the volume of urine. These are: (1) the colloid osmotic pressure of the blood, (2) the level of the blood pressure, (3) the blood flow through the kidney, and (4) the pulse pressure in the glomeruli. The extent to which

MEDICINE

and the Biologic Sciences



this fluid is reabsorbed by the tubules will in turn determine the ultimate volume of the urine.

Diuretics act in diverse ways in promoting urine secretion. Water, urea, and neutral salts act osmotically by presenting the organism with agents which must be eliminated in order to maintain homeostasis. Acidifying salts, such as ammonium chloride, act by causing a passage of salt and water from the cells into the extracellular spaces and by osmotic effect. The important group of mercurial diuretics acts by inhibiting the reabsorption of salt and water by the tubules. A few other salts, such as digitalis and desiccated thyroid, cause diuresis as side effects.

The diuretics are classified as follows: (1) agents altering the composition of the tissues (water, urea and salts), (2) acidifying agents, (3) xanthine derivatives, (4) mercury compounds, and (5) miscellaneous diuretic agents.

When renal function is normal, the administration of water constitutes the simplest method of increasing the volume of urine. Water may be considered as the most physiologic of all diuretics. It is promptly eliminated in the urine when renal and cardiovascular functions are normal.

Water is the ideal diuretic when only increase of volume of the urine is desired to reduce irritation of the

urinary tract as in urethritis or cystitis, or to prevent the deposition of insoluble urinary constituents, as in renal lithiasis or gout, or after the administration of sulfonamide derivatives. Water may be given as lemonade, fruit juice, milk, or other beverage.

For patients with adequate renal function, urea is an effective and non-toxic diuretic. It acts simply by presenting the organism with a non-threshold substance, the excretion of which entails the loss of water.

Sodium chloride exerts a delayed diuretic effect in normal persons. However, in the presence of renal or cardiac disease, edema may result. Ingestion of coffee, tea, and similar beverages results in a diuretic effect greater than that anticipated from the water content alone. This is due to the presence of the xanthine drugs (caffeine, theobromine, and theophylline).

The diuretics are employed primarily and most effectively in reducing obvious edema, and when increase in intracellular fluid content is not apparent clinically. The maintenance of an increased urinary output is also an important measure in chronic renal insufficiency, to promote excretion of metabolic waste products at a maximum rate. The most important and effective use of the diuretics is in the management of persons with chronic congestive heart failure. With limited activity, digitalis, and sodium restriction, diuretics constitute the basic features of therapy.

Grollman, Arthur: *The Diuretics*, *Mod. Medicine* 19:59-64 (June 1) 1951.



Head Injuries

The most important factors in the treatment of head injuries are (1) careful initial examination, and (2) close observation of the patient in the immediate post-traumatic period. The vital processes should receive particular attention. Usually, shock is easily combated with a few hundred cubic centimeters of saline.

Adequate pulmonary ventilation must be maintained. The patient should be placed prone with his head turned to one side so that secretions will drip out and the tongue will fall away from the pharynx.

Changes in the state of consciousness in the period after a head injury are of great diagnostic importance. A cerebral compression by a dural hemorrhage is indicated when a coma follows a lucid interval. When progressive focal signs of neurologic dysfunction are found, dural hemorrhage is likely. The most reliable localizing sign is an ipsilateral pupillary dilation.

Diagnosis of a progressive hemorrhagic lesion is difficult when a patient never regains consciousness. Changes in pulse rate, blood pressure, and respiration cannot be relied upon as indications of increasing intracranial pressure.

If the coma deepens or continues unchanged, trephination should be performed. Even if no hematoma is found, the surgeon may be able to remove necrotic, lacerated brain tissue or relieve pressure on the brain stem by cutting the tentorium. Prolonged unconsciousness is indicative of severe damage to the brain stem.

In the acute stages of a head injury special diagnostic procedures are of little value. A lumbar puncture is advisable in every case of suspected head injury simply to establish evidence of subarachnoid bleeding for legal purposes.

Roentgenograms of the skull are best deferred until the patient is convalescent unless the clinical findings indicate a surgical complication such as dural hemorrhage or depressed fracture. Electroencephalography is of a diagnostic and prognostic importance in chronic phases.

Restlessness is best allayed by special nursing care and the use of drugs. Paraldehyde is effective in such cases. Barbiturates may be necessary. Morphine should be avoided because of medullary depressant effects. Catheterization of a full bladder or the removal of a small amount of bloody spinal fluid may relieve an agitated patient.

Antibiotic agents should be given to all patients with bleeding or discharge from the nose or ear. If rhinorrhea continues for a week or if meningeal infection is evident, surgical intervention should be considered. With the use of antibiotics the surgical treatment of scalp wounds may safely be postponed for twelve or more hours.

Walker, A. Earl: *Head Injuries, Neurology* 1:75-84 (January) 1951.



Immunization for Influenza

Most physicians do not advocate routine immunization against viral influenza today. There is little or no cross immunity between different strains of the virus. New strains appear from time to time which are not affected by commercially available vaccines.

Usually, the disease lasts only two to four days and patients recover rapidly with few complications. However, influenza is still the seventh leading cause of death in the United States.

The influenza virus does not commonly invade the blood stream as do the viruses of measles and yellow fever, which tend to produce lifelong immunity. The influenza virus cannot attack through the exposed surface of mucous membranes and without being exposed to the antibodies and leukocytes in the blood. As a result a person may be vulnerable even a short time after a previous infection.

The incidence of influenza is highest in December and January. The present commercial strains can be expected to immunize against the strains included in the vaccine for four or five months. Therefore, October seems to be the best time for vaccination.

Full development of immunity requires two to four weeks. Influenza virus vaccine types A and B should be used rather than either type alone. The adult immunizing dose is 1 cubic centimeter injected subcutaneously. Two doses of 0.1 cubic centimeter

are given intracutaneously to children three days apart.

Woolington, Samuel S.: *Immunization with Influenza Virus Vaccines, California Med.* 74:87-88 (January) 1951.



Gout

Gout is essentially a disease of the geriatric age group. It is rarely seen before the age of thirty. However, gout is the commonest type of arthritis after the age of forty.

The gouty patient is old enough to have, or to have had, any other type of arthritis. It is assumed that no particular type of arthritis confers immunity against any other type of arthritis. Therefore, each patient must be evaluated individually. As a result, the diagnosis of "mixed arthritis" is frequently made.

Most patients with gout are in the better socio-economic group. Almost 80 per cent of them are past the age of forty years. Most gouty patients are overweight, they overeat and overdrink, they are in need of exercise, good air, and sunshine. Many have insipient hypertension, remedial biliary disease, and various types of foci of infection. They are in the cancer age group. Their occupational and economic status lend them to coronary artery and cerebrovascular diseases. They are more susceptible to a variety of serious complications such as nephritis, hypertension, and arteriosclerosis.

Every gouty patient should have the benefit of a thorough diagnostic survey. One method involving both diagnosis and treatment is based upon the intravenous administration of colchicine. In the acute phase of the attack, the patient is put to bed and given a soft diet and abundant foods. Due consideration is given to the individual complications or co-existing disease. Opiates of any kind are avoided during the diagnostic phase. Once the diagnosis is established, opiates for the relief of pain are optional but are not given to control diarrhea or nausea and vomiting. These more undesirable side-effects

do not arise on intravenous colchicine therapy.

The frequency of this therapy is determined by the patient's needs. In some of the more advanced or severe cases, or in cases having frequent acute attacks, the colchicine-sodium salicylate is given once each day indefinitely. It is believed that a low purine, low fat diet is justified.

The interval treatment is really the treatment of chronic gout. It is well to

remember that gout is chronic with acute exacerbations from the onset. The gouty patient usually ends up with varying degrees of loss of function and more or less severe damage to the joints.

If the lower extremities are involved, as they usually are, attention must be given to optimum exercise and walking, minimizing walking up and down stairs and on rough terrain. Physical therapy and massage

are useful. Orthopedic surgery is indicated when the patient has disfiguring or disabling tophi.

Suttenfield, F. Daniel: Early Diagnosis and Management of Gout, Geriatrics 6:96-99 (March-April) 1951.



Failure of Tonsillectomy

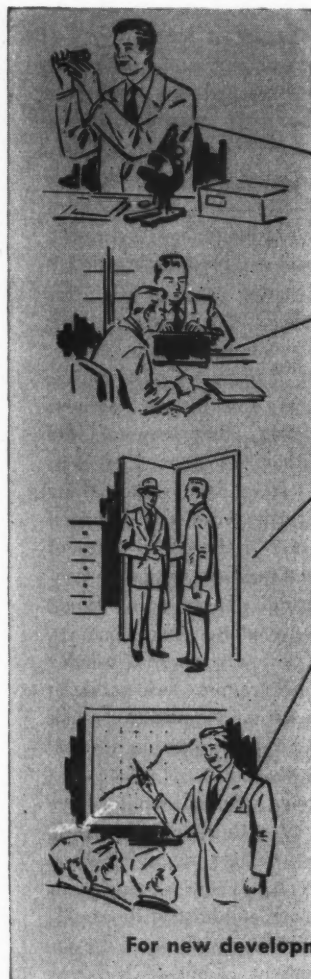
Several studies have been reported which reveal that the tonsillectomy as usually performed is generally not a successful operation. Tonsillectomy is the commonest surgical operation, constituting about one-fourth of all operations performed.

Some operators report an incidence of tags as high as 80 per cent. The variations noted by different physicians are probably due to differences in the criteria for identification of a tonsil tag. It has been noted that the incidence of otitis media, sore throats, and other diseases commonly associated with clinically infected tonsils is increased in patients with incomplete operations.

The single characteristic that distinguishes the palatine tonsil from other lymphoid tissue of the pharynx is the crypt. Lymphoid tissue of the adenoid or lingual regions does not contain crypts. Inflammation often facilitates identification by accentuation of the crypt.

Patients usually assume that the tonsil grows back but this may not be the case. It is probably true that there is commonly considerable extra capsular lymphoid tissue. This peritonsillar lymphoid tissue probably is not tonsil tissue. Irregular, rounded lobules of tonsil 2 to 20 millimeters in diameter extend beyond the so-called capsule into the peritonsillar tissue. These parts of the tonsil can easily be left in place by rough, careless dissection, some tags may represent such lobules left in place. Most of the tags are at the top or bottom of the tonsil and are plainly bits of the visible tonsil not disturbed by crude dissection with blunt instruments and snares.

Tonsillectomy has certain inherent factors that make it an extremely difficult operation. The exposure is



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limited by the size of the mouth and cannot be improved by using a retractor. Illumination can only come from one direction. Hemostasis is difficult because of the small size and depth of the avenue of approach. It is necessary to use long clamps and tie knots at finger tip length. The usual position of the patient during operation causes the blood to collect in a point at the line of dissection. Often the blood runs down the throat causing the patient to gag and cough or arousing apprehension of pulmonary complications.

In patients operated on with consideration and a purposeful effort to remove all tonsil tissue, the incidence of tonsil remnants is greatly reduced.

Hyde, T. L.: *Failure of Tonsillectomy*, J.A.M.A. 146:1478-1480 (August 18) 1951.

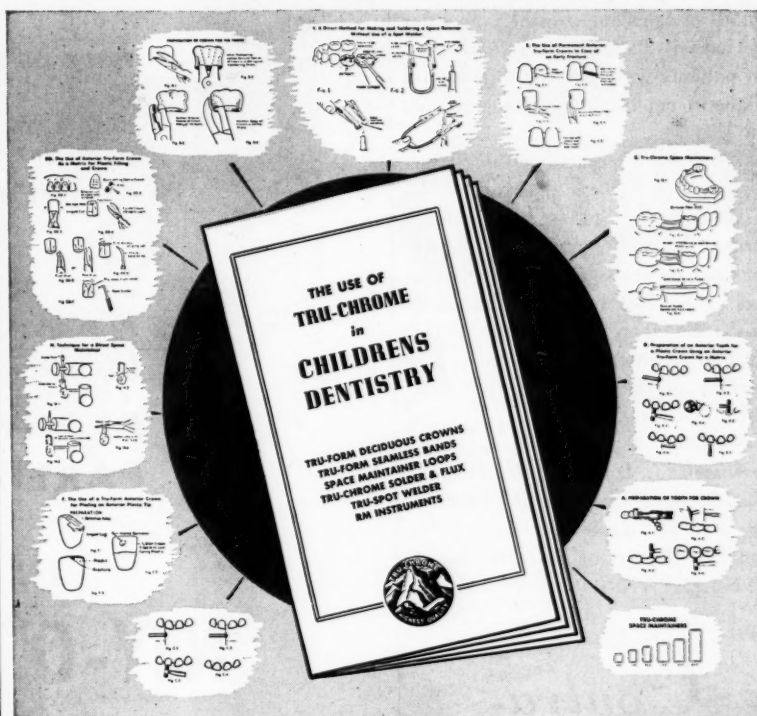


Coronary Thrombosis from Shock

It is well to keep in mind that patients over 50 are susceptible to coronary thrombosis as a result of shock. Any fall of blood pressure in these patients should be avoided if possible. If it does occur, it should be treated vigorously and not allowed to persist for more than a few minutes.

Thrombosis is thought to result from circulatory stasis and, possibly, sludging of the blood in the coronary arteries. Transfusion of adequate quantities of blood and plasma by increasing the output of blood from the left ventricle and augmenting coronary blood flow should significantly reduce the tendency to coronary thrombosis and insufficiency in shock.

It has been found that the majority of these patients show some pathologic evidence of previous coronary artery disease. Some of the conditions causing shock are: (1) surgical operation and anesthesia, (2) postoperative peritonitis, (3) barbiturate poisoning, (4) trauma, (5) burns, (6) insulin, and (7) arsenic poisoning. In most of these situations shock lasts longer than one hour. Death occurs from one to twelve days after the shock episode.



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Importance of Control of Diabetes Mellitus

Particular emphasis should be placed on the relationship between

control of diabetes mellitus and the development of degenerative lesions in the kidneys, retinas, and blood vessels. Ideal or perfect control of diabetes mellitus implies that a balanced diet has been so well utilized by an adequate insulin effect that blood and urine tests are invariably normal.

Patients with excellent or good control do not show advanced calcifications or pronounced retinitis even after periods of 20 to 34 years of diabetes mellitus. Diabetic nephropathy does not develop in patients with

good or excellent control even after periods of 20 to 34 years. However, in patients with poor or fair control diabetic nephropathy frequently occurs.

Whatever the specific etiologic factors causing diabetic degenerative lesions may be, it has been demonstrated that the regulation of diabetic mellitus controls these factors. Control of diabetes mellitus is thus more important than any known factor, such as duration or severity, in prevention of these degenerative complications.

Wilson, J. L.; Root, H. F.; and Marble, A.: Prevention of Degenerative Vascular Lesions in Young Patients by Control of Diabetes, Am. J. M. Sc. 221:479-490 (May) 1951.

Contra-Angles



Speaking of Speech

My friend, the filling station proprietor, is filled with wisdom. Although the formalities of education have passed him by, he has acquired a knowledge of mankind that is never trapped within the covers of a book. I am thinking now of his reactions to various kinds of physical defects and incapacities.

He says that he would rather be crippled, blind, or deaf than have a cleft palate. People show sympathy to the crippled, to the one who cannot see, to the one without hearing. The cleft palate sufferer, on the other hand, is subject to malignant ridicule. Think of the stories that we have heard that have had for their motif the blurred speech of the cleft palate victim. Haven't we told a few ourselves?

Man alone has the power of speech. An animal, almost any animal, can run faster than man. The sight and hearing of many animals is far su-

perior to the development of these senses in man. Why is it, then, that when man is blemished in speech by an opening in his palate he is the victim of the taunts of his fellows? A difficulty in the skill of speech, the skill that man alone possesses, should make the sufferer feel the sympathy of all mankind.

We have ridiculed the person with the palatal cleft. We have done little in an organized way to rehabilitate him. We have societies and associations, and government subsidized programs to aid the crippled, the hard of hearing, the sightless. We col-

lect money and formulate programs for research and treatment of these afflicted. There is no national organization to help explain the cleft palate victim to the world or to help in his rehabilitation. A few dedicated souls like the late Jack Fitz-Gibbon of Holyoke, Massachusetts, and Herb Cooper, of Lancaster, Pennsylvania have tried to interest the world in the problem. Their zeal to stir their own dental colleagues to action has, for the most part, fallen on barren ears. Although the dentist could do real service to help in the rehabilitation of many victims, he has been cool and

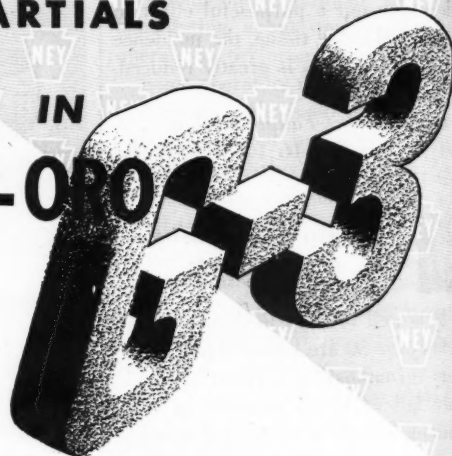
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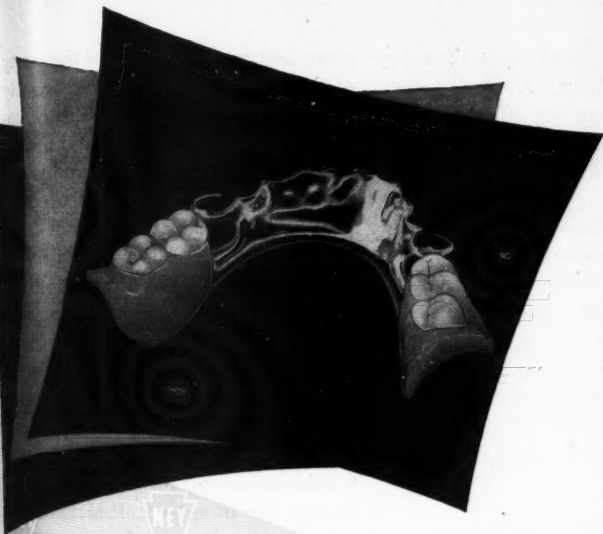
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indifferent to this opportunity.

Man may have perfectly formed and functioning speech organs. He may even possess an eloquence and a facile skill in speech and yet he may have little power to communicate with accuracy and understanding. Communication failures among people are more numerous and often more disastrous than mechanical failures in our automobiles, TV sets, or refrigerators. Human errors—carelessness and poor judgment in driving an automobile, for example, are the causes of more highway accidents and deaths than are caused by the

mechanical defects and failures in automobiles. My inaccuracy in expressing myself can do more to harm and maim my friends and neighbors than the physical irritations I may inflict upon them by mowing the lawn at six o'clock on Sunday morning or being boisterous and disorderly at midnight. By my noise and my thoughtlessness of my neighbors' rights I may be a plague upon them but I do not inflict painful strains upon their deeper personalities.

When I speak of the injuries we inflict by inaccurate speech I am thinking of the inadvertent traumas

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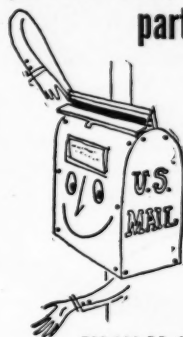
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that we create. The person who sets out deliberately to insult or defame is not the subject of this discussion. The raw boor or the insolent shrew is easily identified and may be treated appropriately. The label is always plain to see and hear.

I am thinking now of our stupidities in speech, our vague referents, our confused thinking, our diffuse and complex expressions, our meaningless yappings and Babel; in short, our tongue-waggings that are more reflex and exercise in nature than they are of cerebral origin. We all

talk more for sound effect than for actual communicating. It is often when we are sounding off that we stir up misunderstanding and resentments. We need not be malicious to be harmful.

Let me cite three recent examples from my own experience:

Number One: A wedding reception. A pleasant fellow, well stimulated by champagne, was making good-natured fun of his wife and her people who were of different racial origin from his own. He was also an avowed and hearty member of a major political

party and his references to the party of the opposition were all vigorously uncomplimentary. There was no malice in this chap. He was sounding off. Whether he created any trauma in his listeners I do not know, but what he was saying was of the stuff that brawls are made. The people present were genteel and the occasion made for merriment. I can picture the same remarks made in other surroundings and at other times and the bloodshed that might follow.

Number Two: A dental office, my own. A patient was scheduled for a 4 P.M. appointment. We wished to change the time to 2 P.M. Several calls to the home of the patient brought no response. When the patient appeared punctually at 4 P.M., I said: "We have been calling you to change your appointment to 2 P.M., but it doesn't make any difference to me."

The patient replied in unmistakable anger: "It makes a big difference to me to make this trip for nothing."

He thought that I meant that we would not keep the 4 P.M. appointment. What I meant was that it was entirely satisfactory to me to see him at the 4 P.M. appointment time.

Here was a patient of more than twenty years standing with whom I had always enjoyed an extremely cordial relationship. Here were the seeds of a real misunderstanding.

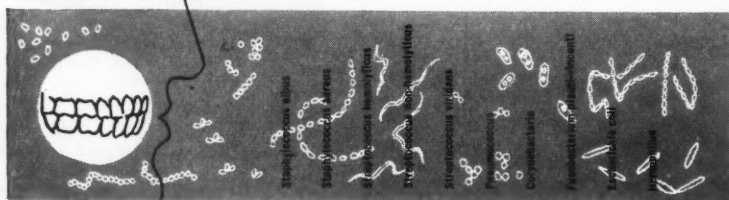
I am not a placid fellow and have been known to explode into violent temper. On this occasion I knew I was entirely wrong in my indefinite and inaccurate speech. I told the patient: "I am sorry that I didn't make myself clear. The fault is mine."

Gentleman that he is, the patient remarked that he was too hasty in his reaction. Our friendship was endangered but fortunately it has not been injured. It could have been.

Number Three: The Board of Directors of an important professional group is meeting in a university building. There are eight men present. All have dental degrees. In addition, two have Ph.D. degrees, one has an M.D. degree, and all have had other types of college training and discipline.

The chairman remarks: "Another organization of which I am a member

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is growing too large. For my part, I would prefer to select twelve men from the group and meet for a week once a year to talk brass tacks." This was an aside. It was not an order of business and no action was necessary.

Four of us driving home from this meeting began to talk about this aside remark made by the chairman.

Two of the group of four thought that the chairman said: "Another group of which I am a member is growing *smaller*. For my part, when the membership is reduced to twelve I will like it better. Then we can meet for a week once a year to talk brass tacks."

Here was a 50 per cent disagreement! How was the situation handled amicably without deflating egos or hurting feelings? By agreeing to check the facts and to see if actually the organization under discussion was *growing larger* or *becoming smaller*. The moral is verify before you vilify!

Everyone talks with people, from a hermit who communicates only occasionally to the politician who talks most of the time. All of us need a blueprint "for preventing troubles that come when people talk together." Fortunately, such a blueprint is available in the book, *HOW TO TALK WITH PEOPLE*, by Irving J. Lee, Ph.D.

I cannot be the objective critic about this book because Irving Lee is a close and respected friend of mine. I can say, however, that Irving Lee himself practices everything he recommends in his book. No better tribute than the tribute of consistency can be paid to any author.

Among his teachings on the subject of human communication are these fundamentals:

1. It takes two to make communication.
2. Disagree without being disagreeable. We should never forget that the soft answer deflects the wrath.
3. Do not prescribe before you describe. In other words, make a diagnosis before you outline treatment in any situation.
4. Do not make people feel inferior. Ego injury is a serious trauma.
5. Avoid casting undue blame by

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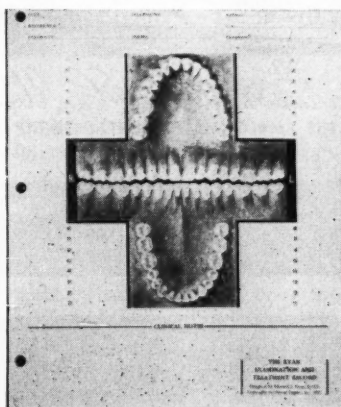
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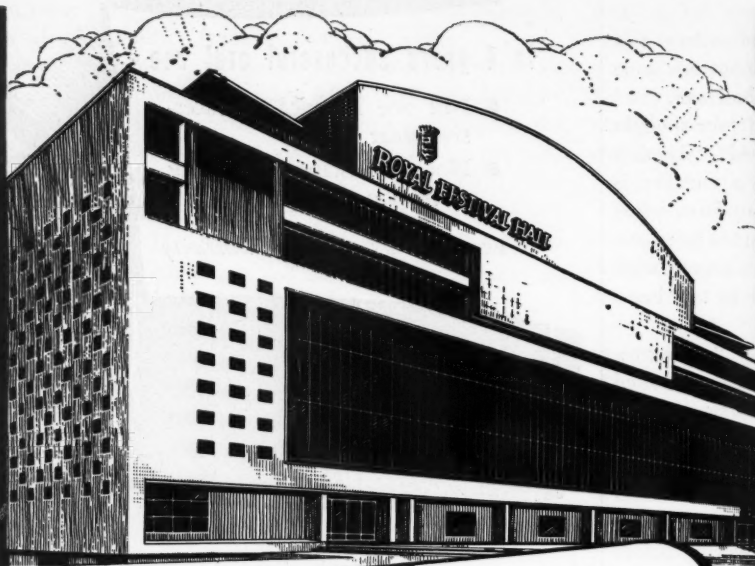
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An Invitation...

IF YOU ARE attending the Congress of the Federation Dentaire Internationale which will be held in Royal Festival Hall, London, England, in July of this year, we extend to you a cordial invitation to visit the Amalgamated Dental Group's exhibit — which will occupy the center position in the exhibition hall.

We shall also be pleased to make arrangements for you to visit one of the Group's engineering plants, situated near London, to see at first hand the care, craftsmanship, and organization that insure the quality of all "Amalgamated Dental" products.

The services of the Professional and Technical Division — located at 12 Swallow Street, Piccadilly — will be at your disposal during your visit to the Congress.

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using the stigma word or giving excessive praise with the halo word.

6. Recognize the patterns of disagreement:

- a) The inquiring-investigative attitude.
- b) The air of incredulity.
- c) The inclination to laughter.
- d) The expression of suspicion and distrust.
- e) The mood of dismissal.

Every dentist, and every other person for that matter, who attends meetings of any kind will be in agreement with Irving Lee on what constitutes a good meeting:

"1. The people should deal with the business on hand with no digressions and no dealing with subjects not on the agenda.

2. There should be no time wasted by speakers 'beating about the bush' or repeating themselves.

3. Everybody should listen carefully to everybody else.

4. The required decisions should be reached and all plans made.

5. The less bickering the better.

6. The chairman will keep things moving in orderly fashion from point to point.

7. Several people will not try to talk at once.

8. The floor is not to be hogged by a few. Everybody is to have an equal chance to speak.

9. No long speeches.

10. People should know what they're talking about, and not talk when they don't have a worth-while contribution.

11. No interruptions.

12. Everybody should arrive on time and stay until the end of the meeting.

13. Dispense with preliminaries, like announcements, reports, and gossip and get down to business."

Cleft palate disability is a severe one. The afflicted would like to talk but he does not have the structures to produce clear speech. Despite how clear his thoughts and how orderly his discipline, he cannot communicate well. He has an excuse for his communication failures. We fortunates have no such excuse when we flub our talk with other people. When we lament that people misunderstand us

In your ORAL HYGIENE this month



Are you trying to do the work of two specialists—your own and that of the investment and securities expert? If you are, and would like to be relieved of the burden of this second "specialty," read John Y. Beaty's article. Mr. Beaty is editor of *Investor's Future*.

★ ★ ★

Who but the pedodontist can avoid the menopausal woman in his practice? The middle-age years are usually the period of dental, as well as mental, distress, and the distraught woman—already besieged by unfamiliar physical and emotional symptoms—must submit to still further unknown pain and strain. Dentists who are anxious to help these difficult patients—and themselves—to endure appointments with minimum tension will be grateful for Doctor John Bell Williams' article, "Women, Their Flightiest Hour."

★ ★ ★

"New Industry . . . Plastic Skulls" introduces the work of two physicians, one dentist, and one technician . . . and, if you're in need of a skull or skeleton for classroom or office use, you'll be happy to learn of the Medical Plastics Laboratory where rather costly original bones are reproduced, economically, in minute detail.

Country practices sound ideal—and they are, if you are the sort of dentist who can fit into a small community. Doctor S. J. Levy analyzes the requirements, advantages, and disadvantages of rural practice and offers practical advice to the dentist who would move from the city to the country.

★ ★ ★

Do you come home "bushed" on Saturdays? Is your office as crowded as a bus station on this last working day of the week? If so, perhaps you should make a few changes in your working hours. Often patients who request Saturday appointments are willing to accept evening hours if they are available, and the dentist who substitutes two after-dinner hours for three morning hours may find that he has actually gained time—and perhaps new patients. That is why Charles P. Fitz Patrick asks, "Have You Reviewed Your Working Hours Lately?"

★ ★ ★

How far is the government to be permitted to go in granting "privilege" and exacting "penalty" in its dealings with the dental profession? Doctor Edgar A. Johnson, suggesting that security and freedom may be opposite states, advises and warns "The Inconsistent Dentist."

CLINICAL AND LABORATORY SUGGESTIONS

(See pages 316 and 317)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST
708 Church Street
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From: _____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

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the fault is usually with ourselves; we did not make the effort to make indifferent to this opportunity.

Man may have perfectly formed ourselves plain. According to Irving Lee, it is not so important to know what *words* mean as to know what *he* meant. Saint Francis of Assisi had the same thought when he prayed, not so much to be understood as to understand.

—E. J. R.

Surgery in Patients With Cortisone-Induced Adrenal Insufficiency

THE CORTEX of the adrenal gland may partly atrophy during long-term treatment with cortisone. Should this happen, the natural supply of cortical steroids may not be sufficient at a time of acute stress, such as during and after anesthesia and operation, when steroids are essential to prevent shock and circulatory collapse. Anesthesia and operation are well tolerated when such patients are prepared preoperatively by the administration of cortisone.

Perhaps the most satisfactory schedule for preparing patients who are known to have adrenocortical suppression consists in the intramuscular administration of 100 to 200 milligrams of cortisone per day for two or three days before operation and on the day of operation. A similar schedule also may be used for two or three days postoperatively, with a gradual reduction of the dose until it reaches the previous optimal figure.

On the other hand, there are instances of emergency in which a patient requires anesthesia and immediate operation. In such cases no such schedule of treatment is possible; hence it is imperative to ask such a patient or someone who can speak for him whether he has been receiving cortisone or corticotropin (ACTH). If so, use of about 30 to 50 cubic centimeters of rapidly acting aqueous adrenocortical extract injected intravenously and repeated as needed, in addition to resumption of cortisone or corticotropin therapy, is imperative to maintain the unprepared pa-

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PROCEDURE AREA: (Circle) 8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8

INJECTION (check): INFILTRATION ☒ MANDIBULAR ☒ INFRAORBITAL ☐ ZYGOMATIC ☐

GRADE OF ANESTHESIA (check): A ☒ B ☐ C ☐ VOLUME INJECTED: 4.4 cc.

TIME (enter hour and minute): INJECTION MADE AT 10:55 A.M. ONSET 10:56:35

WORK COMPLETED 11:20 NUMBNESS DISAPPEARED 2:30 P.M.

BLEEDING (check): SLIGHT ☒ MODERATE ☐ EXCESSIVE ☐ TREMOR ☐ PAIN ☐

REACTIONS (check): NONE ☒ PALPITATION ☐ PERSPIRATION ☐ FAINING ☐

IRRITATION ☐ EDEMA ☐ SWELLING SITE INJECTION ☐ D.D.S. (over)

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tient safely during the period of stress so that he may be assured thereby of the support necessary for survival.

This matter is sufficiently important to justify a warning to internists, surgeons, and anesthesiologists to be certain that cortisone, corticotropin, and aqueous adrenocortical extract is available for the immediate treatment of the patient undergoing anesthesia and operation whose stress response mechanism may be impaired due to prior treatment with cortisone or corticotropin. It is imperative that such a patient receive proper treatment pre-operatively, during the operation, and postoperatively. If this is done, it is believed that lives will be saved.

From Editorials and Comments, *Journal of the American Medical Association* 148:422-423 (April 19) 1952.

Thromboembolism-Prevention

Many clinicians maintain that the frequency of thromboembolic disease in both medical and surgical patients warrants the adoption of broad prophylactic measures to reduce this incidence.

For preoperative surgical patients certain procedures should be done routinely. These are: (1) reduction of weight in the presence of obesity, (2) correction of varicose veins if feasible, (3) medical supervision of cardiac abnormalities, (4) correction of anemia, and (5) administration of a diet with high carbohydrate and vitamin content.

Postoperative measures for prophylaxis recommended include: (1) early ambulation, (2) leg exercises in bed, (3) avoidance of compression of calf veins, (4) use of elastic stockings in those with varicose veins, and (5) use of anticoagulant drugs. Repository heparin appears to be the most suitable of the anticoagulant drugs. Its administration is simple. It has a rapid and prolonged effect with a wide margin of safety. It also requires a minimal laboratory control.

Prophylactic vein ligation should be reserved for patients in whom anticoagulants might aggravate a bleeding tendency and for chronically bed-

fast patients who have thromboembolic potentialities.

The entire program of postoperative prophylactic treatment should be applied to all patients who (1) have a history of thromboembolic or occlusive arterial disease, (2) are in cardiac failure, (3) have large hearts or auricular fibrillation, (4) are obese, debilitated, polycythemic, or anemic, and (5) are over fifty and have no specific contraindication to anticoagulant therapy. For the majority of normal patients below the age of fifty, prophylaxis can be with-

held unless periodic examination of the lower extremities reveals early phlebothrombosis.

Conclusions derived from the data of cases receiving prophylactic treatment suggest that repository heparin may be useful in the therapy of thromboangiitis obliterans, diabetic atherosclerosis, endarteritis obliterans, and frostbite.

Lowe, L.; Berger, L.; and Lasser, R. P.: *Prevention of Thromboembolism, Angiology* 2:26-46 (February) 1951.

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Significance of Fever

The elevation of body temperatures can be considered as a more or less physiologic process. Elevations are noted in: (1) metabolic diseases, such as acidosis and eclampsia, (2) conditions involving tissue necrosis, such as infarctions and the disintegration of blood clots, and (3) the infectious diseases in general.

Patients in the terminal stages of a fatal illness or those severely ill with

an infectious disease, especially the aged with pneumonia, frequently exhibit normal or subnormal temperatures. This signifies little or no resistance. It can be assumed that a failure for a fever to develop in response to a severe infection calls for a grave prognosis.

An unexplained fever should be an indication for extensive studies and anxiety on the part of the physician and patient. Conditions where elevations are recorded are (1) malignant

(Continued on page 336)

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D.D.7

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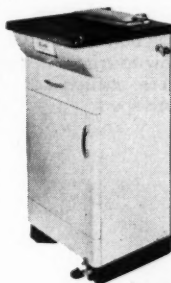
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1450 BROADWAY, NEW YORK 18, N.Y.

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See page 333 D.D.7
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See page 333 D.D.7
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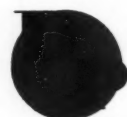
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(Continued from page 333)

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syphilis, (5) undulant fever, (6)
thrombosis-embolism-infarction phe-
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Neal, M. Pinson: *Diagnostic Drifts,
Deceptions and Common Misses*,
J.A.M.A. 146:537-541 (June 9)
1951.

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